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An Investigation of the Classroom Component of Positive Behavior Intervention and Support System on Appropriately Engaged Behavior

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AN INVESTIGATION OF THE CLASSROOM COMPONENT OF POSITIVE BEHAVIOR INTERVENTION AND SUPPORT SYSTEM ON APPROPRIATELY ENGAGED BEHAVIOR

by

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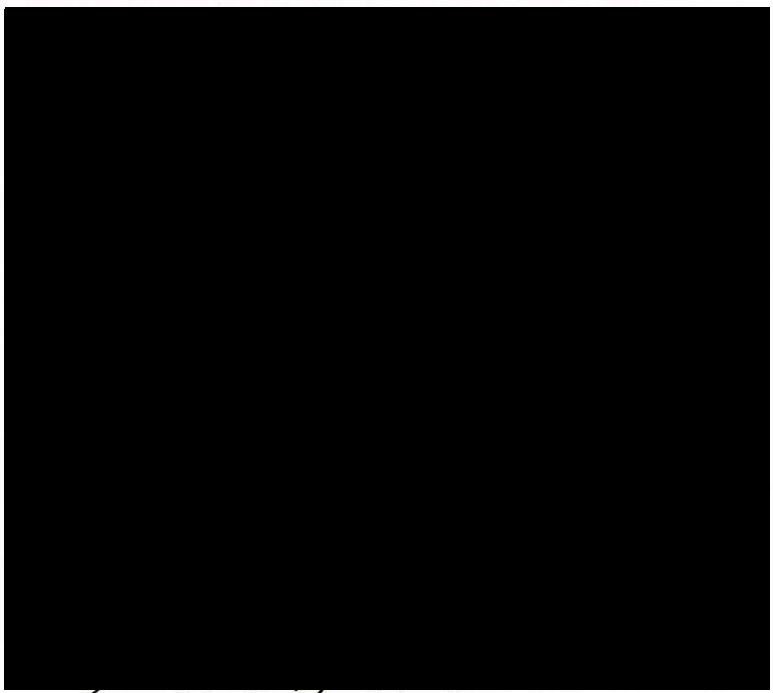

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ABSTRACT

AN INVESTIGATION OF THE CLASSROOM COMPONENT OF POSITIVE BEHAVIOR INTERVENTION AND SUPPORT SYSTEM ON APPROPRIATELY ENGAGED BEHAVIOR

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The purpose of the present study was to evaluate the effectiveness of the within-class component of positive behavior support in the form of ticket presentation with verbal praise in the classroom in increasing appropriately engaged behavior. A multiple baseline comparison across three classrooms was utilized to assess and compare each classroom's mean percentage of observed intervals of appropriately engaged behavior across intervention phases (baseline, direct teaching and review of PBIS classroom expectations and rules, direct teaching and review of PBIS classroom expectations and rules with ticket presentation and verbal praise, direct teaching and review of PBIS classroom expectations and rules with ticket presentation and verbal praise with a Lottery system, and follow-up). Results suggest that the additive effects of the class-wide component of PBIS increased students' mean percentage of appropriately engaged behavior.

DEDICATION

This thesis is dedicated to my wonderful parents who have supported me through all of my endeavors. I love you both more than you will ever know, and I could not have done any of this without your love and support.

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CHAPTER I

INTRODUCTION

Several studies suggest the importance of rule setting and will be discussed. However, while these investigations suggest this importance throughout this literature review, they are limited in that a functional relationship cannot be established because these studies are descriptive studies. Gettinger (1988) proposed that a teacher's proactive classroom management techniques must include prevention of disruptive behaviors as a key objective. Both Brophy (1983) and Gettinger noted three distinct ways that proactive classroom management techniques differ from reactive classroom management techniques. First, proactive approaches are strategies and interventions that are preventive, are prepared ahead of time, and involve anticipation of certain situations and planning of reactions to these situations. Second, these strategies prevent or interrupt unproductive behavior through a designed plan and create an environment that facilitates productive student behavior. Third, proactive strategies attempt to prevent problems from occurring by focusing more on increasing occurrences of appropriate behavior within the group rather than providing negative consequences for the occurrence of individual disruptions.

In an attempt to differentiate effective and ineffective teachers at the beginning of the year, Emmer, Evertson, and Anderson (1980) observed 27 third-grade teachers extensively during the first three weeks of school. The purpose of this descriptive study was to gain an understanding of the basic principles of classroom management that produced effective teachers at the beginning of the year. Effective and ineffective teachers were separated into groups based on end of year classroom observations of

average rates for student engagement in academic tasks and off-task behavior and classroom management ratings. Both effective and ineffective teachers provided rules and procedures for each class; however, effective teachers explained the rules to the class, provided examples, and gave the reasoning for each rule.

Teachers perceived as effective spent a large amount of time during the first few weeks of school explaining and reminding students of the rules (Emmer et al., 1980). Effective teachers used a variety of different rewards and were efficient in signaling to the students when appropriate behavior was expected. Also, effective teachers monitored the class carefully and were quick to intervene when disruptive behavior occurred.

In contrast, the majority of ineffective teachers did not monitor their classrooms carefully and were slow to deliver consequences for appropriate and inappropriate behavior (Emmer et al., 1980). Also, ineffective teachers did not have well-established procedures prior to the beginning of the school year. Finally, ineffective teachers provided rules to the classroom which were usually worded in a vague manner (e.g., "be in the right place at the right time"), but introduced the rules in a casual fashion and did not follow-up to insure that the students had in fact learned the rules.

Evertson and Emmer (1982) observed 26 mathematics teachers and 25 English teachers in 11 urban junior high schools for the entire year to determine if they possessed qualities that teachers identified as effective or ineffective. Each teacher was observed in one class period on the first, second, and fourth day of class during the first week of school and at least three to four times during the second and third weeks of the beginning of the school year. Narrative ratings of teacher behavior and observations of the frequency of on-task behavior during different activities (e.g., academic tasks or waiting)

were conducted throughout the school year. Teachers were placed into subgroups of either effective or ineffective teachers based on the average percentage of students coded as off-task in academic activities. In addition, a management effectiveness score was given to teachers based on observers end-of-score ratings that included environmental variables the authors identified as providing an appropriate environment to aid in learning (e.g., low noise levels of the classroom, teacher control, and pupil self control).

Evertson and Emmer's (1982) results identified the more effective classrooms as those that demonstrated higher frequencies of on-task behavior and lower durations of waiting time during the first 3 weeks of school. Narrative ratings indicated a variety of differences in management strategies between teachers identified as effective and ineffective similar to results from Emmer et al. (1980).

According to Evertson and Emmer (1982) the results indicated that at the beginning of the year, effective classroom managers spent more time teaching and rehearsing the classroom rules and evaluating the behavior of students, allowing these teachers to provide the students that were behaving inappropriately with immediate feedback. Effective classroom managers compared to ineffective classroom managers demonstrated greater efficiency, providing immediate consequences to the occurrence of disruptive behavior. Effective teachers provided a strong sense of task orientation allowing them to make effective use of students' time. They communicated assignments in a clear manner and had less down time during instruction.

In an attempt to gain insight into student's perspectives on classroom management techniques, Cothran, Kulinna, and Garrahy (2003) interviewed 182 students from 14 different schools, grades six through twelve. The authors used semi-structured

interviews to gather information on student's perceptions of qualities that effective and ineffective teachers possess. Specifically, the interview addressed students' impressions of their own behavior, classes in which students either behaved or misbehaved, and students' perceptions of the effectiveness of different teachers' classroom management strategies. Students consistently reported that they would engage in appropriate behavior in classrooms where teachers were more caring, respectful, and open to developing relationships. More importantly, students reported that they typically behaved more appropriately in classrooms in which teachers provided clear expectations of student behavior, clear consequences for adherence to the expectations early in the school year, and were consistent in maintaining these expectations and consequences.

In conclusion, effective teachers remind students of the expectations and rules and provide students with examples of rule following behavior. Effective teachers typically provide a rationale for each rule which students are expected to follow. In addition, effective teachers are quick to reward students' rule following behavior and intervene when students are disobeying the rules. Although these studies provide us with an idea of qualities or characteristics of effective classroom managers, they are all not experimental in nature and a causal inference cannot be derived.

Role and Function of Classroom Rules

Daniel Duke (1978) attempted to explore the purpose and nature of rules in the school. Duke (1978) regarded a rule as a "formal statement of expected behavior (other than statutory laws) for which consequences exist if the expectations are not met" (p. 118). An example of a statutory law in the school was school attendance. Duke identified three classes of rules that a majority of schools follow including attendance-related rules,

rules related to behaviors that exist out of the classroom, and rules that exist within the classroom. After observing the school structure and use of classroom rules, he formulated hypotheses concerning the ineffectiveness of schools as a rule-governed organization.

The fact that rules were usually dictated by administrators and teachers was concerning to Duke (1978) since students were not involved in creating and enforcing the consequences for violations of the rules. He also noted that school rules and the consequences for disobeying the rules were not specifically communicated to the students and their parents In agreement with this notion, Hargreaves, Hester, and Mellor (1975) came to the conclusion that teachers rarely explicitly communicate rules to students. A final concerning problem of rule enforcement in the schools was that teachers communicated difficulties with role conflict. More specifically, teachers complained about receiving mixed messages on their expectations of classroom management from administrators, colleagues, and parents.

Duke (1978) stated that rules students were most likely to violate were those that the student's perceived to be not clearly related to the typical goals of the school, were communicated the least, and were enforced the least consistently by administrators and teachers. A major flaw noted was in the belief system that teachers and administrators held concerning the rules in the school. They saw rules as an end in creating productive learning rather than a means, leading students to view teachers as rule enforcers, rather than facilitators of learning. Also, rules that were enforced most frequently were those that offered the most protection to teachers and administrators or were those believed to be the most convenient to teachers and administrators. With this view of teachers as law enforcers, students typically criticized the rules as well as the teachers who enforced

them. This relationship was mostly caused by a lack of logical consequences for disobeyence of the rule. In addition, when students were identified as rule violators, they typically had limited options to disagree with the charges brought up against them.

Duke (1978) noted problems in schools as rule governed organizations in the areas of accurate record keeping, which was generally nonexistent. School rules were rarely evaluated for effectiveness or reexamined in a systematic fashion. The final flaw that Duke noted in the school systems was that teachers and administrators rarely modeled appropriate rule-governed behavior. After observing different schools, Duke believed that the implementation of rules in the schools does not maintain appropriate behavior, but may actually contribute to increases in misbehavior.

A second theoretical view of the roles and nature of classroom rules in a school organization was proposed by Boostrom in 1991. Rules were considered by students and staff the do's and don'ts of classroom life. As opposed to Duke's (1978) classification of rules, Boostrom identified rules specific to classroom behavior including nonacademic procedures (e.g., "Walk in the hallway"), rules concerning completion or attending to classroom work (e.g., "Read the directions before you begin the assignment"), rules concerning relationships with others in the classroom, (e.g., "Don't make fun of other students"), and rules embedded in the subject matter (e.g., "Complete every sentence with a punctuation mark"). He stressed that rules of the classroom allow the teacher to manage the classroom and maintain discipline among the students.

Boostrom (1991) suggested that rules serve to create self-disciplined, responsible persons who do not blindly comply with the rules of an authority figure. More specifically, he stressed that rules are instrumental in classroom management and enable

a teacher to maintain discipline. The orderliness of the classroom contributes to the strength of the relationship of rules to instruction and learning. Also, he stressed that too much attention to the rules may inhibit the development of self-discipline in students.

In conclusion, Boostrom (1991) maintained that teachers should not view classroom rules as the only avenue for securing orderliness and discipline in the classroom. The belief is that if the rules become overemphasized in the classroom, they can pose a threat to an environment that encourages learning and independent thought in students. Teachers need to remember the significance of their rules, so that they are able to understand and justify why they are imposing each rule (i.e., teachers need to understand not only what they are instructing students to do, but why they are doing it).

The role and function of school rules may increase inappropriate behavior rather than increase appropriate behavior, if not implemented correctly (Duke, 1978). In order for school rules to be effective, teachers and administrators need to communicate to students not only the nature and scope of the school rules, but the consequences for failure to obey the rules. When clearly communicated to students, rules can facilitate self-discipline and responsibility in students and can aid in classroom management and discipline strategies for teachers (Boostrom, 1991). Similar to the previous literature discussed, these studies are anecdotal and are not experimental which inhibits the readers ability to construct causal inference.

Proactive Management Techniques, Classroom Rules, and Effective Classroom Rules

The early literature evaluating the effectiveness of classroom rules in increasing appropriate behavior has not supported the use of reading the rules in isolation (Greenwood, Hops, & Delquadri, 1974; Madsen, Becker, & Thomas, 1968). For

example, Madsen et al. (1968) found the implementation of rules alone to be ineffective in improving appropriate classroom behavior. The investigators examined the effectiveness of implementing a classroom rules procedure in decreasing inappropriate behavior in three children in a third-grade classroom. In addition, they investigated the implementation of teacher praise as a response to student's appropriate behavior along with ignoring inappropriate behavior. The teacher was advised to create five to six short rules, phrased in a positive manner (e.g., "Walk quietly in the classroom."), record the amount of time daily the rules were reviewed, and remind students of the rules when rule violation occurred. The implementation of the classroom rules procedure did not decrease the occurrence of inappropriate behavior. However, the combination of classroom rules, praise, and ignoring was effective in decreasing inappropriate behavior. Levels of disruptive behavior deceased from a mean of 46.8% of intervals observed during baseline to a mean of 15.1% of intervals observed after implementing the rules, praise, and ignoring procedure. Limitations of this study include the heterogeneity of the rules created by teachers.

To clarify discrepancies in the effectiveness of classroom rules in decreasing disruptive behavior of the two previously discussed investigations, Greenwood et al. (1974) evaluated the individual effects of rules, rules plus feedback, and rules plus feedback plus group and individual consequences for appropriate classroom behavior. Using a multiple baseline across three classrooms (first, second, and third grades) the authors measured the effects of each component on appropriate behavior as defined separately by each teacher (Greenwood et al., 1974). The teachers were taught to use a clock-light apparatus to measure the duration that appropriate behaviors were

demonstrated by the entire class. Teacher social consequences were also measured and included correct and incorrect social consequences. Social consequences were considered correct (e.g., verbal praise, positive touches such as pats on the head, and gestures such as smiling) if the teacher provided an individual or the group with a positive social consequence within 5 s of the occurrence of an appropriate behavior. Incorrect social consequences consisted of the teacher giving praise or positive social consequences within 5 s of the occurrence of inappropriate behavior (e.g., positively patting a student after he had been looking out the window) or if the teacher gave a negative statement (e.g., reprimands, threats) or negative physical contact (e.g., hitting, spanking, or pulling the student) after the occurrence of an appropriate behavior.

The development of classroom rules was left to the individual teachers and included a posting of appropriate behaviors teachers thought to be relevant to the class' learning environment. The teacher read each individual rule to the class. The consultant then modeled examples of rule-following behavior. During the rule phase, contingent praise was not provided for rule-following behavior. However, the consultant walked around the classroom informing students when they were either following the rules or not following the rules. After the rule-following phase was introduced, a feedback and then an individual and group consequence phase was introduced in addition to each previous phase. The feedback phase involved informing the students of the purpose of the clock-light apparatus and involving them in graphing of the data of the total duration of appropriate behavior. The final phase involved providing individual and group rewards contingent on the students reaching a previously determined duration of the class' engagement in rule following behavior. Throughout this phase, the teacher continued to

provide individual and class-wide praise for appropriate behavior. Results from this experiment demonstrated positive effects of the introduction of rules on teacher's use of correct social consequences (i.e., increased from .28/min to .60/min). However, the introduction of classroom rules failed to yield an effective change in the duration of the class's appropriate behavior. In fact, one of the classes demonstrated an adverse reaction to the rules procedure (decrease in mean levels of appropriate behavior of 60.1% to 49%). The implementation of the entire package (i.e., rules, feedback, and praise for appropriate behavior) resulted in systematic increases in appropriate behavior in all three of the classrooms with overall mean increases over baseline of 31.2%, 24.5%, and 44.5% in classrooms A, B, and C, respectively. Two limitations of this study included the fact that appropriate behavior and rule creation were not defined and were subject to each teacher's discretion.

Greenwood et al. (1974) and Madsen et al. (1968) demonstrated that the introduction of classroom rules alone was ineffective in either decreasing disruptive behavior or increasing appropriate behavior in students. However, limitations of these two studies included significant threats to external and internal validity. Regardless, investigators of these studies demonstrated that rules in combination with other treatment components such as token economies or the use of contingent praise were effective at either increasing student's duration of appropriate behavior or decreasing the occurrence of disruptive behavior.

To evaluate the effectiveness of different behavior management strategies on increasing rates of desired behaviors and decreasing rates of undesired behaviors, Johnson, Stoner, and Green (1996) compared three different classroom wide

interventions in a general education seventh-grade classroom. Throughout the school day five different teachers in different classrooms instructed the students. Interventions included in this study included active teaching of classroom rules, a self-monitoring intervention, and use of a classroom syllabus with individual academic achievement assessments. The classroom rules intervention was chosen by the math teacher and involved an initial introduction of the rules; re-teaching of the rules each class period for four days, including the use of behavior-specific prompts; and teacher feedback at least three times per class period. The self-monitoring intervention was chosen by the reading teacher and involved providing students with a point system in which each student would give themselves points for following the classroom rules and provide comments as to why they deserved the points that they had given themselves. Students were given 2 min at the end of each reading class to give themselves 1-3 points depending on their own rule-following behavior. At the end of the week, the points were calculated and recorded as a part of the student's grade. To prevent lying, the teacher confronted students that she thought were rewarding themselves points that they did not earn. Finally, the language arts teacher chose the weekly class syllabus intervention. At the beginning of every week the teacher provided the students with a list of activities and assignments due that week along with two brief discussions concerning the students' current grades, general progress, and any late or missing assignments.

After three weeks, all three interventions were evaluated through three separate A/B design phase changes. Johnson et al. (1996) compared each classroom's mean levels of appropriate, inappropriate, and disruptive behavior to their mean levels during intervention. The authors then determined that actively teaching classroom rules was

found to be the most effective intervention to decrease class-wide disruptive and inappropriately engaged behaviors and increase appropriately engaged behaviors. After implementing the rule intervention, students in the math class exhibited mean level increases in appropriately engaged behavior of 45%, mean level decreases in inappropriately engaged behavior of 17%, and mean level decreases in disruptive behavior of 7%. After implementing the two less effective interventions, students exhibited mean level increases in appropriately engaged behavior of 20% and 25%, mean level decreases in inappropriately engaged behavior of 10% each, and mean level decreases in disruptive behavior of 12% and 15%, in the reading and language arts classrooms, respectively. The authors determined the rule intervention was the most effective at decreasing median levels on inappropriate and disruptive behavior and increasing median levels of appropriately engaged behavior compared to the other two interventions. Median levels of engagement in appropriate behavior were observed to occur in 90%, 77%, and 67% of intervals in a 20-min observation for the rule, self-monitoring, and syllabus interventions, respectively. Median levels of inappropriate behavior were observed to occur in 5%, 7%, and 13% of intervals for the rule, self-monitoring, and syllabus interventions, respectively. Finally, median levels of engagement in disruptive behavior were observed to occur in 2%, 5%, and 10% of the intervals in a 20-min observation for the rule, self-monitoring, and syllabus interventions, respectively. The rules intervention was then implemented in the reading and language arts classrooms and demonstrated positive class wide effects compared to the mean level of students' behavior in the previous intervention condition. Specifically, mean level increases in appropriately engaged behavior of 10% and 25%, mean level decreases in

inappropriately engaged behavior of 2% and 10%, and mean level decreases in disruptive behavior of 2% and 4% in the self-monitoring and syllabus intervention classrooms were demonstrated, respectively. In addition, median level increases in appropriately engaged behavior from 75% to 85% and 65% to 85%, median decreases in inappropriate behavior from 7% to 5% and 13% to 2%, and median level decreases in disruptive behavior from 5% to 2% and 10% to 5% were demonstrated after introducing the rule intervention in the self-monitoring and syllabus intervention classrooms, respectively. A major limitation of this study involves the use of an A/B phase change experimental design which may limit the validity of the author's conclusions.

Hebert (1997) examined the effectiveness of direct teaching of classroom rules along with direct teaching of classroom rules paired with teacher praise contingent on rule following in increasing the mean percentage of intervals students exhibited appropriately engaged behavior in three third grade classrooms. In addition, the frequency of disruptive behavior and inappropriately engaged behavior was evaluated in each phase. Appropriately engaged behavior was defined as a student directing attention towards or engaging in the currently assigned classroom activity. Disruptive behavior was defined as "environment or created noise, and was unrelated to the current assigned material or activity" (Hebert, 1997, p. 39). Inappropriately engaged behavior was then defined as the student attending to materials or activities other than the current assigned activities.

The rule establishment process involved a review of the referral problems of the classroom with each teacher and the primary investigator and generating three to four positively stated rules (Hebert, 1997). After consultation, the teacher held a group

discussion of the classroom rules, which resulted in changes in wording of the established rules based on student input. The rules were then posted in a prominent area of the classroom so that all students were readily able to review the classroom rules. Prior to direct teaching, the primary investigator and each teacher participated in role modeling and role-playing procedures to insure the teacher's understanding of the created rules and teaching procedures. Direct teaching of the classroom rules occurred at least twice a day prior to the beginning of instruction.

The second component of Hebert's (1997) investigation involved praising students in the classroom contingent upon student adherence to classroom rules. Teachers were instructed to offer praise at least once every five minutes specific to the behavior that the student emitted. Using a multiple baseline across classrooms, after the implementation of the direct teaching of the classroom rules phase, the students exhibited increases in mean levels of appropriately engaged behavior per 20-min observation in two of the three classrooms (i.e., from 18% to 40% and from 27% to 43% in classrooms one and three, respectively) compared to baseline. The author also demonstrated decreases in the mean frequency of disruptive behavior per 20-min observation in two of the three classrooms (i.e., from 44.80 to 35.83 and from 39.50 to 18.60 in classrooms one and three, respectively) and in inappropriately engaged behavior (i.e., from 111.00 to 62.17 and from 92.40 to 60.25 in classrooms one and three, respectively). The addition of contingent praise proved to be an extremely effective addition to the classroom rules intervention. After implementing the contingent praise component, mean levels of appropriately engaged behavior per 20-min observation increased compared to direct instruction of the rules phase in all classrooms (i.e., from 40% to 66%, 6% to 23%, and

43% to 61% in classrooms one, two, and three, respectively). The substantial increase demonstrated by classroom two may be due to the fact that the mean level of appropriate behavior dropped from 20% in baseline to 6% in the direct teaching of the classroom rules phase. Results also demonstrated further decreases in the mean frequency of disruptive behavior per 20-min observation in two of the three classrooms compared to mean levels in the direct instruction phase (i.e., from 35.83 to 22.22 and 25.00 to 18.60 in classrooms one and three respectively) and in inappropriately engaged behavior in all three classrooms (i.e., from 62.17 to 33.40, 126.00 to 113.00, and 60.25 to 38.80 in classrooms one, two, and three respectively). The decreases demonstrated by classroom two may be due to the increase in inappropriate behavior from the baseline condition to direct teaching of the rules condition (i.e., from 113.00 to 126.00). The mean frequency of inappropriate behavior demonstrated in the contingent praise phases was equal to that of the mean frequency displayed in baseline.

The teacher of classroom two was found to have 0% treatment integrity across all observed checkpoints across all phases, which would explain the relative lack of treatment effects in her classroom (Hebert, 1997). Treatment integrity was randomly assessed twice for each intervention condition and once during the follow-up condition. If teachers did not demonstrate 100 % teacher integrity, they were provided feedback by the primary author. Therefore, the teacher in classroom two received training every time 100% integrity was not met. Despite these efforts, the teacher in classroom two consistently demonstrated 0% treatment integrity. These findings suggest that actively teaching classroom rules may be effective in decreasing inappropriately engaged behavior and disruptive behavior, and increasing appropriately engaged behavior in the

classroom. Hebert's findings also suggest that significant impact can be obtained at the systems level, particularly the classroom.

Although the earlier literature suggested that direct instruction of classroom rules was not sufficient at decreasing levels of inappropriate behavior alone, it did suggest that direct teaching of the classroom rules paired with other interventions (e.g., praise, ignoring, or feedback) was successful (Greenwood et al., 1974; Madsen et al., 1968). These studies were limited however, in that rule creation was not defined. Johnson et al. (1996) compared three interventions and determined the rule intervention as being the most effective at decreasing median levels of inappropriate and disruptive behavior and increasing median levels of appropriately engaged behavior compared to the other two interventions. However, the findings of this study are limited due to methodological concerns involved with the use of a simple A/B phase change design. Finally, using a MBL across classrooms, Hebert (1997) demonstrated increases in mean levels of appropriately engaged behavior in two of three classrooms. In addition, Hebert demonstrated decreases in the mean frequency of disruptive behavior and inappropriately engaged behavior in two out of three classrooms. To a lesser degree, her study illustrated the impact of intervention efforts delivered with integrity as compared to intervention efforts lacking implementation integrity. A final limitation of the study includes the possibility of order effects with the use of a multiple baseline design which may pose a threat to internal validity.

Positive Behavior Intervention and Support as a Proactive Management Strategy

Carr et al. (2002) described Positive Behavior Intervention and Support (PBIS) as an applied science that uses strategies based in education to modify an individual's

behavior by minimizing problem behavior. PBIS is designed to modify student's working environments in order to improve student's behavioral repertoire and increase student's quality of life. Carr et al. noted that another goal of PBIS is to help individuals achieve his or her goals in a socially acceptable manner, thus eliminating or reducing the occurrence of problem behavior.

Carr et al. (2002) described the school-wide application of PBIS as being a system that integrates many components into a unified whole. It is a comprehensive lifestyle change and overall improvement of the quality of life of the individuals and all relevant stakeholders (e.g., teachers, employers, parents, and friends). PBIS also includes a systems perspective, which involve parents, teachers, and other relevant change agents in typical settings and interventions are continuously revised and updated. The school-wide approach also involves stakeholder participation behavior emphasizing that stakeholders are active participants in the process and holds social validity in that interventions have practicality, desirability, and are created specifically for individuals. It emphasizes systems change and is a multicomponent intervention in that the focus is on fixing problem contexts, not specific problem behaviors. PBIS emphasizes prevention in that it is intended to minimize the future likelihood of the occurrence of problem behavior (i.e., the best time to intervene is not when problem behavior occurs but when it is not occurring). It is flexible with respect to other scientific practices in that it incorporates a wide variety of research methodology such as correlational analysis, naturalistic observations, case studies, and experimentation. Finally, PBIS is derived from multiple theoretical perspectives. PBIS involves both the individual and systems larger than the

individual; it emphasizes naturalistic settings rather than clinical settings; and it sees research as a collaborative process involving both scientists and stakeholders.

The term "positive behavior support" was coined as an intervention developed for individuals with mental retardation and developmental delays as an alternative to more aversive interventions to decrease self-injurious and aggressive behavior (Horner et al., 1990; Sugai et al., 2000). Throughout the 1990's, PBIS began to be applied as an intervention technique used not only for students with disabilities, but for a wider range of students, and then for the entire school population (Carr et al., 2002; Netzel & Eber, 2003). PBIS is now implemented in many school districts and is used as an application of behaviorally-based systems approaches to enhance different environments such as the school, the family, and the community (Sugai & Horner, 2002).

Procedures used in PBIS are deeply rooted in applied behavior analysis and use empirically supported interventions with the focus of the intervention being contexts or environments in which the individual's behaviors are observed (Dunlap, Carr, Horner, Zarcone, & Schwartz, 2009; Sugai & Horner, 2006). It emphasizes prevention through a continuum of behavioral support utilizing empirically based behavioral technologies, focuses on the student's environment and emphasizes acknowledgment of appropriate behavior of all students in the school. The behavioral support continuum includes three levels of prevention. The three levels of prevention include the prevention of the development of problem behavior (i.e., the primary level of prevention) and reducing the frequency and/or the intensity of the occurrence of problem behaviors (i.e., secondary and tertiary prevention; Sugai & Horner, 2006). Each level of prevention considers multiple contexts for intervention including students' family, district, school, community,

classroom, and nonclassrooms (i.e., the gym, cafeteria, bus, bathroom, playground, and hallway; see Figure 1). All interventions along the continuum are aimed at maximizing positive results, ensuring accountability of the school, increasing effective and efficient communication, and increasing students' progress in the general curriculum.

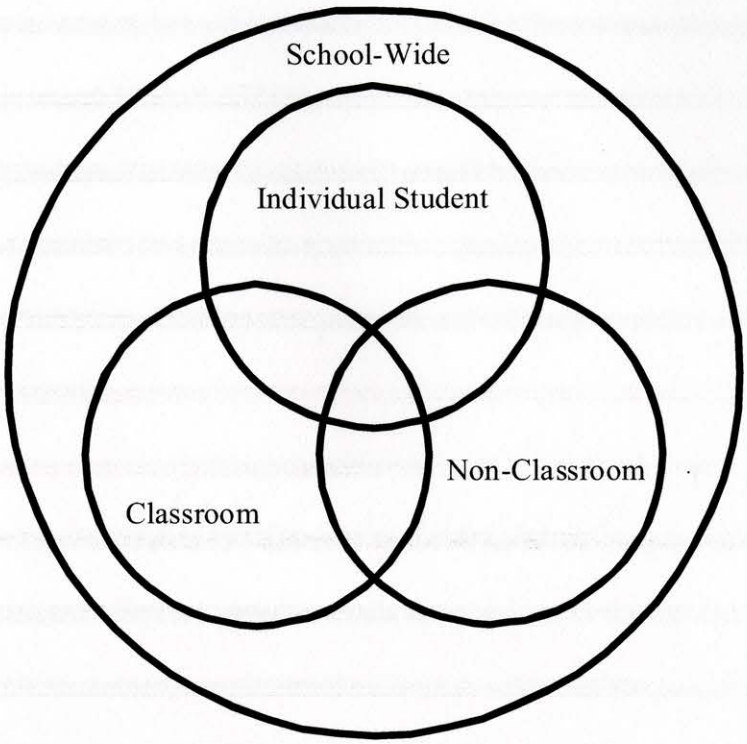

Figure 1. Multiple Systems of School-Wide Positive Behavior Support

Note. From "Center on Positive Behavioral Interventions and Support. (n.d.). *What is a systems approach in school-wide PBS?*" Retrieved November 18, 2008, from www://pbis.org. Reprinted with permission.

Primary prevention is focused on the entire student body and involves school-wide and classroom-wide systems. Although not empirically derived, Sugai and Horner (2006) suggested that primary prevention will successfully address the needs of approximately 80-90% of the student population. It also includes behavioral screening procedures designed to determine which students are in need of supplementary services to address behavior concerns that are not addressed by primary prevention efforts. The

secondary prevention component is suggested to address the approximately 5-15% of students at risk for problem behavior and involves the use of supplemental strategies including specialized group intervention strategies (e.g., token economy systems, self-monitoring interventions). Finally, tertiary prevention is suggested to address students with chronic or intense behavior problems (1-7% of the student population) and involves the use of specialized individual interventions based on individualized assessments of behavior. At this level of intervention individual behavior intervention plans are typically developed to address the particular student's behavioral concern(s). These students have failed to respond to the primary and secondary levels of prevention offered (Sugai & Horner, 2002, 2006).

Implementation of PBIS in the School

Although PBIS is relatively new to the field of school psychology, the elements and procedures that are embedded in PBIS are not new. O'Leary, Becker, Evan, and Saudargas (1969) demonstrated the effectiveness of one of the tools used to teach rules and expectations to students, the token system. The authors attempted to evaluate the effectiveness of classroom rules, educational structure, teacher praise, and a token reinforcement intervention on lowering the occurrence of disruptive behaviors of seven second-grade students from a lower socio-economic school district. All of the components of the intervention were implemented throughout the entire school day. The token reinforcement intervention, however, was implemented only in the afternoon. During the rule phase of the investigation, the teacher reviewed the rules of the classroom once in the morning and once in the afternoon. The investigators offered no rationale for the nine rules that were chosen. The educational structure phase of the study involved the

teacher splitting the classroom into four 30-min activities that the entire class could participate in (i.e., spelling, reading, math, and writing). The purpose of the educational structure phase of the study was to investigate the effects of a more structured classroom on inappropriate behaviors. During the praise and ignore phase of the study the teacher was instructed to praise student's appropriate behavior and ignore student's inappropriate behavior. During the token reinforcement intervention, the students were told that they would receive points in the afternoon when they were following the rules. The points or tokens were placed in small booklets that were placed on the students' desks and the children were told that the points they obtained in the afternoon could be exchanged for small prizes varying in amounts at the end of the day. The authors were interested in determining whether the implementation of the token reinforcement intervention would have an effect in decreasing disruptive behaviors not only in the afternoon, but also whether the effects of the intervention would carry over to the morning.

After analyzing the data, O'Leary et al. (1969) indicated that the introduction of classroom rules, educational structure, and praise and ignore phases of the investigation did not effectively decrease the occurrence of disruptive behavior in the three classrooms which is contrary to findings of Madsen et al. (1968). However, after the introduction of the token system, disruptive behaviors decreased by a mean of 18% in five subjects and 3% in one subject, compared to the praise and ignore condition. When the token system was withdrawn from the classroom, disruptive behavior increased from 5% to 45% in all six children. Reinstatement of the token system yielded a decrease in disruptive behavior in five of the six children. The authors did not provide data for the mean level of disruptive behavior during the reinstatement of the token system. However, the disruptive

behaviors in these five children ranged from 8% to 39% lower during the follow-up conditions than in the praise and ignore condition. Limitations of this investigation included the fact that the selection and presentation of rules was not structured or properly defined; and, the teacher was aware of the purpose of the study and the days in which her behavior was being observed, which increases the probability that she may have changed her behavior an attempt to please the investigators during the observations.

Netzel and Eber (2003) described the challenges teachers and administrators in an urban school district faced when implementing PBIS during the first two years of implementation. The first year of implementation involved educating members of the positive behavior intervention and support (PBIS) team on the three tiered process of matching students to their individual level of need, using preventive approaches to decrease inappropriate behavior by teaching the use of reinforcement for appropriate behavior, and using data to resolve and problem solve areas of concern. The team met roughly every three weeks to discuss expectations of school-wide behavior, to create scripts to aid teachers in communicating the expectations to the students, to create an office referral form to be used by teachers in response to discipline problems and to brainstorm possible alternatives to school suspensions. In addition, the team created a strategy to reinforce students for demonstrating appropriate behavior in the form of "gotcha." The "gotcha" was intended to recognize both the students for following school-wide rules and the teacher that rewarded the students. "Gotchas," were sheets of paper that provided a space for both the student and teacher's name that was then placed in a drawing at the end of each week for a prize.

At the beginning of the first year students were taught the expectations of PBIS (Netzel & Eber, 2003). Each lesson usually took approximately 20-30 min per week and involved students practicing the appropriate behavior(s) that complied with the expectations. After the practice session and for the remainder of the week, teachers pointed out examples of appropriate behavior, which resulted in the receiving of a "gotcha" and non-examples of appropriate behavior. Teachers were encouraged to treat every instance as a learning opportunity. The PBIS team took a gradual approach at shifting teachers from purely reactive approaches by educating teachers on the ineffectiveness of reactive approaches (i.e., suspension) and the effectiveness and timesaving benefits of proactive approaches. Office discipline referrals (ODRs) and suspensions were the dependent variables of this pilot study. Results demonstrated a 22% decrease in student suspensions. Since ODRs were not used prior to the implementation of PBIS, no data were reported for the previous academic year. Although no baseline ODR data were available for comparison, staff reported that there was a fairly gradual decrease in discipline referrals throughout the course of the school year. Staff suggested that the speculated decreases in ODRs could have been attributed to the novelty of PBIS. Qualitative information from the pilot study demonstrated improvement in the attitude of staff and students toward school climate, an overall decrease in staff turnover, and positive attitudes of staff toward the procedures involved in the PBIS procedures. A key limitation of this study is conclusions are based on anecdotal information.

Scott and Barrett (2004) evaluated the effectiveness of PBIS by measuring the amount of time involved in disciplinary procedures by students, teachers, and administrators. The investigators trained five members of an urban elementary school

district in the principles of PBIS and then instructed them to introduce the procedures to the rest of the school district. The investigators used data from the past year's discipline referrals to determine the average amount of time spent by administrators, teachers, and students in the discipline process. A discipline referral was determined to cost an administrator 10 min and a student 20 min, with a suspension costing 45 min of administrator's time and up to 6 hours of student time. Loss of student time was suggested to be correlated with student achievement due to the loss of instructional time. Investigators found that the number of discipline referrals decreased from 608 in the baseline year to 108 in the first year and to 46 in the second year of implementation. In addition, student suspensions were reported to decrease from 77 during the baseline year to 32 in the first year and then to 22 in year two. During the two years that PBIS was implemented in the school district, a total of 10.4 days of administrator time was saved during the first year and 11.7 days during the second year. In addition, a total of 72.7 days of student instructional time was saved during the first year of implementation compared to the baseline year and 86.2 days during the second year compared to year one of implementation. After running fiscal analyses computing administrators' yearly salary and the average amount of money it costs to enroll one student each day of school, the investigators indicated that PBIS saved the school district $9,106.92 during the first year of implementation and $10,667.74 during the second year. The findings of this investigation imply that PBIS not only enhances the learning environment but also decreases the amount of time and money that a school district expends in the disciplinary process. Since this study was not a strong research design, a crucial limitation of this study is that causal statements cannot be inferred.

PBIS has been demonstrated to increase appropriate behavior in a variety of settings. Kartub, Taylor-Greene, March, and Horner (2000) demonstrated that PBIS procedures can be used to decrease noise levels in the hallway during transition periods to lunch with sixth, seventh, and eighth grade students in a rural middle school. Prior to the intervention, teachers had voiced concern that the magnitude of noise in the hallway was perceived as a serious problem. Using a pre-post, descriptive, nonexperimental design (e.g., baseline, intervention, and follow-up) the authors measured program effectiveness with a Realistic Sound Level Meter once a minute for five minutes during transition periods. During baseline phases, the hallway monitor collected decibel data, prompted students to talk quietly, and handed out detentions to students who exhibited loud noises. The noise reduction phase involved teachers ensuring that all students were able to discriminate "loud" from "quiet" with 7-min training sessions during lunch. During this time, students were exposed to modeling of walking through the hall without talking and walking through the hall talking loudly. Students then rated the modeled behavior as quiet or loud. Next, students were exposed to a small blinking light in the hall and instructed that if the light was blinking then the hallway noise was getting too loud. The final part of the intervention included informing students that if three consecutive days with quiet transitions were attained, students would be awarded five extra minutes of free time at lunch.

Results of the current experiment indicated that the mean decibel levels during baseline were 74.8, 76.5, and 76.8 for the sixth, seventh, and eighth grade students, respectively (e.g., decibel levels of 70 were described as too loud and decibel levels of 90 were described as water at the foot of Niagara Falls; Kartub et al., 2000). After

intervention, mean decibel levels reported were 67.4, 68.6, and 68.9 for the sixth, seventh, and eighth grade class, respectively. In addition, during the follow-up phase the authors demonstrated that the results could be sustained with mean decibel levels of 67.2 for both the sixth and seventh grade classes and 67.8 for the eighth grade class during the 10-day follow-up phase. One limitation of this study is that no causal statement can be made since the authors used a non-experimental design. In addition, the intervention phase was conducted prior to the end of the school year only allowing follow-up to be attained at the beginning of the next school year. Therefore, follow-up for the sixth grade class was not a true follow-up since those students were never provided with an intervention.

Evaluation of the Implementation of PBIS

Bohanon et al. (2006) evaluated the effects of PBIS in an urban high school. The high school represented a variety of culturally diverse groups of students including 36% African American, 36% Hispanic, 16% Asian American, 8% Caucasian, 2% Native American, and 2% from other cultural backgrounds. Bohanon et al. sought to measure both the process and outcome of implementing PBIS in the high school. Process measures included the use of the *School-wide Evaluation Tool* (SET; Horner et al., 2004) and the *Effective Behavior Support* (EBS; Sugai, Horner, & Todd, 2000). The first year of the study involved teaching and organizing the implementation of PBIS procedures. Outcome measures included ODRs and climate survey data. Using a pre-post (A/B) design, the investigators compared the effects of PBIS between baseline (Year 2) and implementation (Year 3). Bohanon et al. (2006) indicated that by Year 3 of the study, the high school had reached an overall level of 80% implementation across five domains of

the SET, (i.e., expectations are defined, expectations are acknowledged, system for responding behavior, making data-based decisions, and management), with deficits in "behavior expectations are taught", and "district-level support" domains. The most impressive result of this investigation was the decrease in ODRs after the implementation of PBIS. The investigators noted that a 20% reduction in average daily ODRs was obtained during the first year of implementation with decreases in both minor infractions (e.g., dress code violations) and major infractions (e.g., serious disobedience of authority). Bohanon et al. (2006) reported a decrease in students having multiple discipline referrals after the implementation of PBIS. Discipline referrals decreased from 32% of students in Year 2 to 25% of students in Year 3 having two to five discipline referrals and 21% of students in Year 2 to 16% of students in Year 3 having six or more discipline referrals. ODRs were not collected during the first year since that year was designated to planning of PBIS implementation and data collection. Although ODR change data would have been informative, such data were not made available by the authors. There are a few limitations of this study which should be noted, the first being that this study employed an A/B simple phase change design which decreases the validity of the outcome measures. Secondly, the investigators failed to report ODRs in the planning year, therefore decreasing the internal validity of the study. Finally, no causal statement can be made about the results since the study was descriptive. However, McCurdy, Mannella, and Eldridge (2003) demonstrated a decrease in the number of ODRs per student in both the classroom and the school yard after implementing PBIS. Comparing the number of ODRs given to students in the baseline year to the first year of

implementation of PBIS, students demonstrated decreases in total number of ODRs per student of 37% in the classroom and 53.8% in the school yard.

PBIS Evaluation Measures

Both psychologists and administrators need measures of implementation to ensure that PBIS procedures are being implemented accurately. There are a variety of ways to measure the implementation of PBIS. Tools used to evaluate districts' implementation of PBIS include the *School-wide Evaluation Tool* (SET; Horner et al., 2004), and the *School-wide Benchmarks of Quality* (BoQ; Kincaid, Childs, & George, 2005; Cohen, Kincaid, & Childs, 2007). The SET was developed to measure the extent to which schools implement PBIS with fidelity, whether training and technical assistance result in school-wide improvement in PBIS implementation, and if implementation of PBIS is related to a substantial change in the safety, social culture, and behavior in the school. The SET consists of 28 items which are organized into subscales that represent the key features of PBIS. Horner et al. defined seven key features of school-wide PBIS including (a) defining 3 to 5 school-wide expectations for appropriate behavior, (b) teaching the school-wide behaviors to all students, (c) monitoring and providing students with rewards following the expectations, (d) correcting problem behaviors with a systematic and consistent continuum of consequences, (e) gathering data on students' problem behaviors to guide and evaluate decision making (f) obtaining leadership from school administration that actively supports and is involved in the PBIS procedures, and (g) obtaining district level support of training and implementation of PBIS procedures in the form of functional policies, staff training, and data collection options. The SET is completed by a trained observer who is not employed by the school district and is based

on interviews with administrators, staff, teachers, and students. In addition, observers review permanent product data including school policies, training curricula, meeting minutes, and behavioral data. One limitation of the SET is that it provides no information on the effectiveness or treatment fidelity for the secondary and tertiary levels of prevention, since it was intended to assess only the primary prevention aspect of PBIS.

Similar to the SET, the BoQ is intended to measure the degree of fidelity a school is implementing PBIS (Cohen et al., 2007). However, the BoQ differs from the SET in that it does not propose to measure the effects or gains in the school environment from the implementation of PBIS procedures. The BoQ also differs from the SET in that is completed internally through self-report. The BoQ was designed to allow school personnel to evaluate and review progress towards implementing PBIS with fidelity. The evaluation tool consists of 10 subscales including (a) organization of the PBIS team, (b) faculty commitment, (c) development of disciplinary procedures, (d) data entry and analyses, (e) development of expectations and rules, (f) establishment of rules or recognition plans, (g) establishment of lesson plans for teaching the rules and expectations to students, (h) creation of implementation plans, (i) creation of crisis plans, and (j) creation of evaluation tools (i.e., students and staff are knowledgeable of PBIS procedures, staff display adequate levels of PBIS implementation, and data on level of behavior problems or attendance are used to guide decision making). Similar to the SET, a limitation of the BoQ is that it is only intended to measure the level of fidelity of PBIS implementation at the primary level. A second limitation of the BoQ is the possibility of rater bias. Additionally, raters may not accurately assess the performance of their school

due to limited exposure to PBIS implementation or lack of direct observation of implementation procedures.

As part of the data evaluation discussed in the SET and the BoQ, administrators typically measure decreases in a variety of outcome measures including time as money and outcome surveys. Furthermore, ODRs are used as indicators of the effectiveness of implementation of PBIS (Kincaid, Knoster, Harrower, Shannon, & Bustamante, 2002; Metzler, Biglan, Rusby, & Sprague, 2001; Scott & Barrett, 2004; Walker, Cheney, Stage, & Blum, 2005).

The use of ODRs as the primary indicator of the effectiveness of PBIS implementation is rather concerning for several reasons. ODRs fail to provide information related to increases in appropriate behavior, although one could assume that decreases in ODRs are reflective of increases in appropriate behavior. Additionally, ODRs may fail to assess students experiencing internalizing problems that might not manifest themselves in an ODR. While one could use the count of tickets or tokens awarded for displays of appropriate behavior by students as another indicator of display of appropriate behavior, this approach relies heavily upon teacher and administrator observation and acknowledgement of those exhibited behaviors.

ODRs can serve as an indicator of PBIS effectiveness at the system-wide level (i.e., the entire school) and at the individual level (i.e., one particular student). Although major and minor infractions attempt to classify the severity of ODRs, there is still no way to verify the accuracy of teacher's judgments. ODRs rely heavily on the actions of teachers and whether they have the time or resources to write up referrals which may decrease the reliability and validity of ODRs as an indicator of PBIS effectiveness.

Despite all the problems with ODRs, most schools that implement PBIS do not provide independent verification of teachers' ODRs, leaving educators without a way to assess the accuracy of teachers' judgments of students' behaviors. Many of these concerns with the use of ODRs leave the impact of PBIS difficult to assess.

The PBIS literature discussed has demonstrated that PBIS has proven to be successful at decreasing disruptive behavior in the classroom and in school settings (Kartub et al., 2000). These studies, however, are limited in that the methodology of the study was not clearly defined and non-experimental designs were used, thereby limiting the ability to make causal inferences (Kartub et al., 2000). In addition, some researchers use subjective staff report to demonstrate the effectiveness of PBIS implementation in decreasing discipline referrals (Netzel & Eber, 2003). Since these findings were based on anecdotal information, cause cannot be inferred. Finally, Scott and Barrett (2004) demonstrated that PBIS procedures can serve to not only decrease ODRs and school suspensions but also save money. However, information obtained from this study was achieved by defining time as money through the use of a non-experimental design. This leaves the reader unable to infer causality. Although there is a wide range of literature discussing the impact of PBIS on a school-wide level, there is a scarcity of research focusing on the impact of PBIS in the classroom.

Purpose of the Present Study

The purpose of the present study was to evaluate the effectiveness of positive behavior support in increasing appropriately engaged behavior in the classroom. More specifically, the present study was intended to assess the additive effects of three of the classroom components of PBIS at increasing appropriate behavior (i.e., direct teaching of

PBIS rules, presentation of tickets and verbal praise, and Lottery). In addition, to assess whether effects of the intervention would be maintained two-, three-, and four-week follow-up observations were conducted.

Research Questions

The following research questions are offered:

1. What are the effects of teaching PBIS classroom expectations and rules specific to those expectations on student's appropriately engaged behavior?
2. What are the effects of combining the teaching of PBIS classroom expectations and rules with verbal praise and the presentation of tickets as tokens on appropriately engaged behavior?
3. What are the effects of combining the teaching of PBIS classroom expectations and rules, the presentation of tickets as tokens, and teacher verbal praise with the implementation of a weekly Lottery system on appropriately engaged behavior?
4. Will students' engagement in appropriate behavior and teachers' implementation of the program be maintained two-, three-, and four-weeks after the termination of the project?

CHAPTER II

METHOD

Participants

The study was conducted in a second-, third-, and fourth-grade general education classroom from a participating elementary school district in south Mississippi. All observations occurred during mathematic instruction. This study was approved by the institutional review board (see Appendix A). All three participating classrooms were referred by the principal of the elementary school for behavior management problems. The second grade teacher, Ms. Caleb, was an African American female with twenty years teaching experience. Ms. Caleb indicated that her predominant concerns for her classroom were disruptive behavior that occurred over long periods of time and problems keeping her students on-task for extended periods of time. The third grade teacher, Ms. Jackson, was an African American female with 7 years of teaching experience. Ms. Jackson indicated that her primary concerns for her classroom included noncompliance, talking out, disruptive classroom behavior, and throwing tantrums. The fourth grade teacher, Ms. Prudence, was an African American female with less than a year of teaching experience. Ms. Prudence indicated that her primary concerns for her classroom included overall disruptive behavior and talking out.

Informed consent to participate in the current investigation was obtained from each teacher (see Appendix B) referred for participation by their principal. In order to participate in the current investigation, appropriately engaged behavior (AEB) could not occur in more than 80% of the observed intervals in a 20-min classroom screening observation (see Appendix C; Koegel, Harrower, & Koegel, 1999). The screening

observation was a momentary time sampling observation in which the classroom was divided up into rows or groups of students. The screening session was conducted to ensure that students in each classroom were not engaging in AEB in more than 80% of observed intervals. The screening observation was a 15-s momentary time sampling procedure. One group or row of students was observed one minute. After one minute had elapsed, the second group of students was observed one minute. This continued until all rows or groups of students had been observed. The observers then moved to the first row of students once he or she had reached the last row. During the minute that one of the groups or rows of students were being observed, a momentary time sampling observation of AEB of the entire row or group of students occurred, once every 15 s. Classrooms that engaged in AEB in no more than 80% of the observed intervals during this screening observation were included in the current investigation. None of the classrooms that were screened engaged in AEB in more than 80% of the observed intervals and thus were not excluded from the current investigation.

Setting

All three classrooms were located at the same school building. In addition, data were collected during the spring semester for all three classrooms. All sessions took place in the classroom during mathematics instruction with the exception of the last observation in the third grade classroom which took place during snack time. Classrooms varied in organization of the desks, placements of teacher's desks, teaching material posted on the wall. However, all classrooms were appropriate for typically developing students. To some extent, PBIS procedures were in place at the school. However, a SET or a BoQ had not been completed at the school to provide an overall percentage of implementation of

PBIS procedures. Anecdotally, some PBIS procedures were in place (i.e., public posting of the school rules in one hallway and knowledge of the occurrence of reward assemblies and parties for positive behavior).

Independent and Dependent Measures

For the purpose of this investigation, AEB was defined as the student directing attention towards the currently assigned activity or the student being engaged in the currently assigned activity. Trained observers conducted 20-min momentary time-sampling observations in each classroom at previously identified times during academic instruction based on the information taken from the teacher interview. Each teacher indicated that mathematics instruction was the setting in which the most inappropriate and disruptive behavior occurred; therefore, all observations were conducted during that instructional time. All observations lasted 20 min with the exception of one observation in Ms. Prudence's class. The fourteenth data point in Ms. Prudence's class lasted only 16 min due to a change in the school's schedule. Observers gathered baseline data on students' AEB. Observations began at the onset of the instructional period identified during the consultation process as the period in which students engage in low levels of appropriate behavior. Observations began at the front left position of the classroom and ended at the bottom right position. Each of the three classrooms was divided into rows or groups of desks. Each row or group was observed in turn, for an equal amount of time, throughout the 20-min observation period alternating from row to row every minute with each row or group of students being observed for four 15-s consecutive intervals. All observations were conducted with the aid of an audio recording that cued the beginning of each interval with two beeps and the 10-s mark with one beep with 5 s in between

intervals to allow for the recording of data. During the first 10 s of the observation, observers did not attend to the particular row or group of interest. Once the audio recording signaled the end of the 10-s interval, observers momentarily observed the specific row or group of students. If all of the students in that row or group were engaged in appropriate behavior at that moment, the observer recorded AEB for that row or group. However, if one or more student in that row or group was not observed to be engaged in appropriate behavior at that moment, the observer did not record AEB as occurring. The observer had the remainder of the 5 s to record the occurrence or nonoccurrence of AEB. Observation data were recorded as follows: the number of observed intervals of AEB was divided by the total number of possible intervals observed and then multiplied by 100 to obtain a mean percentage of AEB for that observation session.

Ticket presentation combined with verbal praise (TP) was defined as teachers presenting students with a ticket contingent on students' adherence to any of the classroom rules combined with teacher verbal praise. Teacher verbal praise was defined as any positive statement from the teacher (e.g., "I like the way that you picked up your materials after you were through with them!" or "I like the way you are sitting at your desk reading!") contingent on students' AEB. At the end of each week, students were allowed to enter all tickets won that week into a drawing for a previous selected reward that occurred after lunch on Friday every week (or the last day of the school week).

Teacher verbal praise was defined as teachers providing a student or groups of students with a positive statement from the teacher contingent on students' AEB. Teacher verbal praise was only recorded as occurring if it was not combined with a ticket presentation.

TP and verbal praise alone were recorded using a frequency recording within intervals method throughout the 20-min observation period since TP and verbal praise alone were observable behaviors, discrete, and were expected be occurring at low frequencies (Hayes, Barlow, & Nelson-Gray, 1999). The number of observed instances of TP or verbal praise contingent upon student AEBs was totaled for the 20-min observation session and was divided by the total number of minutes of the observation to obtain a mean rate of TP and a mean rate of verbal praise across phases per 20-min observation. Treatment integrity of teacher's implementation of TP was assessed for at least 33% of the observations of TP phase, the Lottery phase, and the follow-up phases for each classroom.

Materials

Teachers were provided with a Lottery box or container (e.g., a box with a slit in the box to insert tickets). Tickets were deposited into the Lottery box either by the students or by the teacher, depending on the teacher's preference (see Appendix D). The design of the tickets as well as the ticket procedures did not vary across classrooms since all three classrooms were from the same school with the same PBIS expectations. The creation of tickets was based on the primary investigator's consultation with the teacher. Tickets created were those identified by the teacher and primary investigator as developmentally appropriate. However, each ticket included a space to provide the name of the student to whom the ticket is presented. Four tickets were pulled every Friday (or the last day in the school week) after lunch per classroom. Students' tickets that were pulled were allowed to choose from the selection of previously chosen items or activities (see Procedures section below).

Design

A multiple baseline comparison across classrooms was used to assess the treatment effects for each classroom (Kazdin, 1982, 1984). The design compared each classroom's mean percentage of observed intervals of AEB across phases (baseline; direct teaching and review of PBIS classroom expectations and rules; direct teaching and review of PBIS classroom expectations and rules with ticket plus praise; direct teaching and review of PBIS classroom expectations and rules and ticket plus praise with the implementation of a weekly Lottery; and follow-up). Baseline observations were conducted concurrently for each participating classroom. The phase change of each of intervention was staggered and changed when a clear and stable or decreasing trend was established. All three classes followed this design until direct teaching and review of PBIS classroom expectations and rules, direct teaching and review of PBIS classroom expectations and rules with ticket plus verbal praise, direct teaching and review of PBIS classroom expectations and rules and ticket plus verbal praise with the implementation of a weekly Lottery, and follow-up had been completed in all three participating classrooms.

Procedures

All three teachers were asked to provide informed consent (see Appendix B), to demonstrate agreement to participate in the current investigation and to acknowledge their understanding of the goals, risks, and benefits of their individual and their classroom's participation in the current investigation. Methodology and procedures of the current investigation were based in part on Hebert (1997). Prior to the collection of baseline data, the primary investigator consulted with each teacher to address the

teacher's concerns regarding classroom management, along with previous interventions attempted by the teacher.

Baseline

During baseline, no experimental procedures were in effect in order to assess initial levels of student behavior. A 15-s momentary time sampling observation procedure (10-s observe, 5-s record) was used to gather AEB data (see Appendix C). Data collection began after the initial screening session had been completed and the classroom had met the inclusion criteria for participation in the current investigation. Data from the initial screening session was then used as the first data point in the baseline condition. After a stable baseline had been established for each classroom, teacher consent to participate in the current investigation for each of the three classrooms was obtained prior to any intervention and baseline data were collected on each of the classrooms until a clear and/or stable pattern or a downward trend was evident. Once an appropriate pattern emerged, the teacher was told that she would be trained in proactive PBIS classroom management techniques. The teacher was also informed that data would be gathered throughout the project relative to the objectives of the study. In an attempt to ensure that the teachers were not implementing procedures similar to those of the current investigation, treatment integrity (Barlow & Hersen, 1984; Gresham, 1989) was assessed for at least 33% of observations in this phase (range = 33-40%). Treatment integrity was calculated as a percentage by dividing the number of components completed per day by the number of possible components and multiplying the total by 100. Interobserver agreement (IOA) was assessed for at least 33% of observations in this phase (range = 66-100%).

Direct Teaching and Review of PBIS Classroom Expectations and Rules

Teachers were trained by the primary investigator in the implementation of the classroom component of PBIS. Rules were created through consultation procedures based on teachers' concerns for the classroom. All rules were consistent with the school's PBIS expectations. See Appendix E for examples of each teacher's rules. First, direct teaching and review of PBIS classroom expectations and rules were taught using a written protocol (see Appendix F) read silently by the teachers, followed by a behavioral role modeling session conducted by the investigator (see Appendix G).

During the direct teaching and review of the PBIS classroom expectations and rules phase, the teachers were instructed to read aloud each PBIS classroom rule to the students once a day prior to the instructional period and review according to the instructions provided in Appendix F. The second and third grade class read the rules right at the beginning of the day since the students' in those two classrooms stayed in the classroom for the entire day. The fourth grade classroom, however, read the rules immediately prior to the observation period (i.e., 1:00 p.m.) since that was the time that the students transitioned to that classroom. Three to five rules were created during consultation with the teacher and the primary investigator. Rules for each classroom remained consistent with the school's PBIS expectations (e.g., "be safe", "be responsible", be respectable."); and were positively stated (e.g., "Keep your hands and feet to yourself; Cohen et al., 2007; Horner et al., 2004; Kincaid et al., 2005). The teachers were provided with feedback by the primary investigator on the accuracy of their technique in this phase with the use of treatment integrity checks for at least 33% of review of the PBIS classroom rules phases. Feedback was based on each teacher's

adherence to the guidelines provided in Appendix F. Treatment integrity was assessed for at least 33% of observations in this phase (range = 40-50%). During the integrity check, if a teacher did not adhere to one or more of these guidelines at any point during the semi-randomly assigned checks, retraining occurred until the teacher demonstrated 100% integrity during retraining. Direct teaching and review of the PBIS classroom expectations and rules was implemented following baseline with each class in a multiple baseline fashion (Hayes et al., 1999). IOA was also assessed for at least 33% of the observations in this phase (range = 50-75%).

Direct Teaching and Review of PBIS Classroom Expectations and Rules with TP

A TP phase was implemented following the direct teaching and review of PBIS classroom expectations and rules phase. The TP phase included presenting students with a TP specific to the student's AEB. The teachers were trained in TP conditions in the same manner the direct teaching and review of PBIS classroom expectations and rules strategy was taught (see Appendix H).

During the second phase of the intervention, TP followed student adherence to the PBIS classroom rules. Each teacher was requested to provide at least one student per row or group that was following a classroom rule with a TP at least once every 5 min. After the teacher had provided a TP to a student from row one or the first group of children, he or she was instructed to present a TP to a student from row or group two during the following five min and told to move to each row for each five-min period thereafter. If there were not any students engaging in an appropriate behavior in a particular row for a 5-min period, the teacher was instructed to move to the next row. Teachers were requested to make each TP explicit to the AEB demonstrated by the student (e.g., "Betty,

I like the way you waited for the teacher to call on you before you talked."). No specific instructions were given to teachers as to how to respond to inappropriate behaviors.

The teachers were provided with feedback by the primary investigator on the accuracy of their technique in this phase with the use of treatment integrity checks for 33% of review and direct teaching of PBIS classroom expectations and rules with TP phases. Feedback was based on each teacher's adherence to the guidelines provided in Appendix H. Treatment integrity was assessed for at least 33% of observations in this phase (range = 36-50%). During the integrity check, if a teacher did not adhere to one or more of these guidelines at any point during the randomly assigned checks, retraining occurred until the teacher demonstrated 100% integrity during retraining. IOA was assessed for at least 33% of the observations in this phase (range =45-75%).

Direct Teaching and Review of PBIS Classroom Expectations and Rules, with TP and a Weekly Lottery

During the third phase of the intervention, all tickets presented to students were placed in a Lottery box or container provided to the teacher by the primary investigator. Once a student had been provided with the TP response the student would write his or her name on the ticket. Every Friday (or the last day of the school week) after lunch, the students placed all of their tickets into the Lottery box and a weekly Lottery was conducted. During the Lottery, the teacher pulled out four tickets from the Lottery box. Students whose names were pulled from the Lottery box were allowed to pick from a variety of tangible items or privileges that were previously selected by the teacher, the students, and the primary investigator (see Appendix I). During the selection of the rewards, the teacher and the primary investigator discussed developmentally appropriate

privileges for which they believed the student's would be encouraged to work (e.g., stickers, pencils, being the teacher's helper, 10 min of extra free time). The teacher then discussed the list with the students, and the class voted on which rewards they would like to be added to the drawing. Once one student's name was pulled, he or she was not able to attain two prizes. If this did occur, the student's ticket was set to the side of the box and another ticket was pulled. After the weekly Lottery, all tickets were removed from the Lottery box. The teachers were trained in Lottery system conditions in the same manner the direct teaching and review of PBIS classroom expectations and rules strategy were taught (see Appendix J).

Follow-Up

One observation occurred at 2-, 3-, and 4-weeks in each classroom after the last observation of the direct teaching and review of PBIS classroom expectations and rules with TP contingent upon rule following behavior and a weekly Lottery. At the conclusion of the direct teaching of the PBIS classroom expectations and rules with TP and a Lottery phase, teachers were instructed to continue implementing the procedures of the current investigation. Follow-up observations occurred during the same instructional period that all other observations occurred (i.e., the instruction period identified during consultation as having the lowest engagement in AEB). Follow-up observations were collected for each classroom to assess maintenance of student's AEB and maintenance of teacher's use of TP and the weekly Lottery system.

Reliability and Treatment Integrity

Interobserver Agreement

IOA was assessed for at least 33% of all observations in each classroom for all phases with the exception of the follow-up phase of the fourth grade classroom. Prior to baseline data collection, secondary observers were trained in the observation and recording of AEBs. In addition, prior to the TP condition, secondary observers were trained in the observation and recording of the TP. Training involved the primary investigator explaining the observation procedures to the secondary observers. Agreements between observers for AEB were defined as intervals in which both observers agreed on AEB as occurring or not occurring in that interval. Agreements between observers for TP were defined as intervals in which both observers agreed on TP as occurring or not occurring in that interval. To calculate a percentage of agreements between the observers, the total number of interobserver agreements were divided by the number of agreements plus disagreements and multiplied by 100. The agreements of the observers on the observed intervals of AEB were then divided by the number of agreements plus disagreements and multiplied by 100 to calculate a percentage.

IOA was collected for 59.74% of the observed sessions. Overall, IOA averaged 96% across all of the measured variables. Individual variables and their mean percentages obtained included: (a) 92% for AEB (range = 80-100%), (b) 99% for TP (range = 93.75-100%), and (c) 97% for Verbal Praise (range = 86.25-100%).

Treatment Integrity

Treatment integrity was assessed for 33% of the observations for each phase of the investigation. During all five phases of the investigation, the primary investigator

recorded whether each teacher had appropriately followed the guidelines while administering the direct teaching and review of PBIS Classroom expectations and rules (see Appendixes E, G, and I). If any of the guidelines were not met during this phase, the primary investigator provided feedback to the teacher by identifying which guidelines were not met and what modifications needed to be met to follow guidelines accurately. If 100% treatment integrity was not achieved during any of the observations with the exception of those observations in the baseline and follow-up phase, the observation was noted, and the primary investigator provided that teacher with further consultation until 100% integrity was reached.

In addition to the previously described treatment integrity observations, observers recorded frequency counts of teachers' contingent TP to students who were following the PBIS rules. Percent treatment integrity was computed for this phase by dividing the number of appropriate teacher responses checked by the observer by the total number of expected times the teacher was asked to give such a response (approximately one administration per 5 min of passed time), and multiplying the resulting value by 100. If 100% treatment integrity was not achieved during any of the observations, the observation was noted, and the primary investigator provided that teacher with further consultation until 100% integrity was reached.

Finally, in addition to the above described treatment integrity observations, the primary investigator recorded whether the teacher had appropriately followed the guidelines while administering the Lottery System (see Appendix J). If any of the guidelines were not met during this phase, the primary investigator provided feedback to the teacher by identifying which guidelines were not met and what modifications need to

be met to follow guidelines accurately. If 100% treatment integrity was not achieved during any of the observations, the observation was noted, and the primary investigator provided the teacher with further consultation until 100% integrity was reached. Table 1 depicts the mean baseline and intervention treatment integrity percentages for each classroom across phases.

Table 1

Mean Baseline and Intervention Treatment Integrity Percentages across Phases

	Classroom		
Phase	Second Grade	Third Grade	Fourth Grade
Baseline	--	--	--
Rules	100	90	100
Rules + TP	85	91	100
Rules + TP + Lottery	94	100	100
Follow-up	94	100	100

Data Analysis

Visual Analysis

Each classroom's rate of AEB and teacher's rate of TP across baseline and experimental conditions was graphed and visually inspected (Kazdin, 1982, 1984) for each classroom. Within-classroom analyses were conducted for each of the three classrooms in the study to evaluate the effectiveness of each class-wide condition on increasing students' AEB and teacher's TP.

Statistical Analysis

Multilevel modeling was used to calculate average intervention effects and determine their statistical significance (Ferron, Bell, Hess, Rendina-Gobioff, & Hibbard, 2009; Van den Noortgate & Onghena, 2003). Multilevel modeling can be used when data are hierarchically structured (i.e., scores at points in time are nested within individuals or groups; Van den Noortgate & Onghena, 2003). The analyses are dependent of each other due to the repeated observations within classes. Because students' scores are not independent, the rules of many statistical procedures are violated. Through the use of multilevel modeling, heterogeneity in intervention effects across cases as well as the serial dependence of scores within cases can be appropriately addressed, thereby permitting statistical inference. In addition to accounting for scores that are dependent, multilevel modeling can be used to account for other sources of dependence, including first order autocorrelation (i.e., how much scores taken at a later period can be predicted by the score that occurs immediately before it). Estimates of fixed-effects and covariance parameters for both within and between phases were calculated.

Clinical Outcome Indices

In addition to the visual and statistical analyses of the data, data were also analyzed to demonstrate the level of impact of the results using methodology based on Parker and Hagan-Burke (2007). Parker and Hagan-Burke (2007) demonstrated that single case researchers could summarize the results of their findings in terms of clinical outcome indices. Clinical outcome indices were developed and are used by evidence-based medical researchers for both diagnosis and treatment studies. Diagnosis studies assess a diagnostic procedure's accuracy in predicting whether individuals will become

sick or well persons. The results of these studies are typically summarized using a 2 x 2 prediction accuracy table that displays the diagnostic procedure's true positives, true negatives, false negatives, and false positives. Parker and Hagan-Burke (2007) demonstrated that single case research can use these same statistical summary 2 x 2 tables to interpret findings by describing baseline of the single case research design as the control condition, the intervention as the treatment condition, and improvement is defined as non-overlapping data between phases. For the purpose of this study, all data collected in intervention phases (i.e., the combined effects of direct teaching of the PBIS classroom expectations and rules, direct teaching and review of PBIS classroom expectations and rules with TP, direct teaching and review of PBIS classroom expectations and rules with TP and Lottery, and Follow-up) phases will be termed Intervention.

Parker and Hagan-Burke (2007) argued that single case research designs (e.g. AB, ABA, multiple baseline, etc.) are able to use clinical outcome indices since these designs share key features with randomized control trials (e.g., both have control conditions or baseline phases; and treatment conditions or intervention phases). The single case research design treats each single data point as one patient in the medical field. In order to use clinical outcome indices, the single case research design must define successful versus unsuccessful data. Parker and Hagan-Burke (2007) define successful data as, "change beyond the level of the baseline phase" (p. 640). Successful data or performance includes treatment data points that outperform all baseline data, and those baseline data points that may outperform treatment data. The *Odds Ratio* compares baseline phase to intervention phase (i.e., direct teaching of the PBIS classroom expectations and rules, direct teaching of the PBIS classroom expectations and rules with TP, direct teaching of

the PBIS classroom expectations and rules with TP and Lottery, and Follow-up) is reported across all three classrooms and for each individual classroom. Finally, *Odds Ratios* across each phase are reported across all classrooms and for each individual classroom.

CHAPTER III

RESULTS

Visual Analysis and Descriptive Statistics

Figure 2 shows AEB percentages for the 3 classrooms across conditions. During baseline, mean AEB was 35%, 18%, and 40% in the fourth, second, and third grade classrooms, respectively. After the implementation of the direct teaching of the PBIS classroom expectations and rules phase, mean AEB was 49%, 35%, and 40% in the fourth, second, and third grade classrooms, respectively. After the implementation of the direct teaching of the PBIS classroom expectations and rules phase with TP, mean AEB was 52%, 56%, and 47% in the fourth, second, and third grade classrooms, respectively. The introduction of the direct teaching and review of PBIS classroom expectations and rules with TP and the weekly Lottery produced mean levels of AEB of 55%, 54%, and 54% in the fourth, second, and third grade classrooms, respectively. Finally, mean levels of AEB were 45%, 47%, and 54% in the fourth, second, and third grade classrooms, respectively, during the follow-up phase. During follow-up in the third grade classroom, the four-week follow-up observation was during snack. This may have inflated the percentage of AEB in this observation since students were only expected to eat their snack and talk with their peers. In addition, during follow-up in the fourth grade classroom, the four-week follow-up observation was not conducted due to end of the year class schedule (i.e., the group of students did not come to math after state-wide testing).

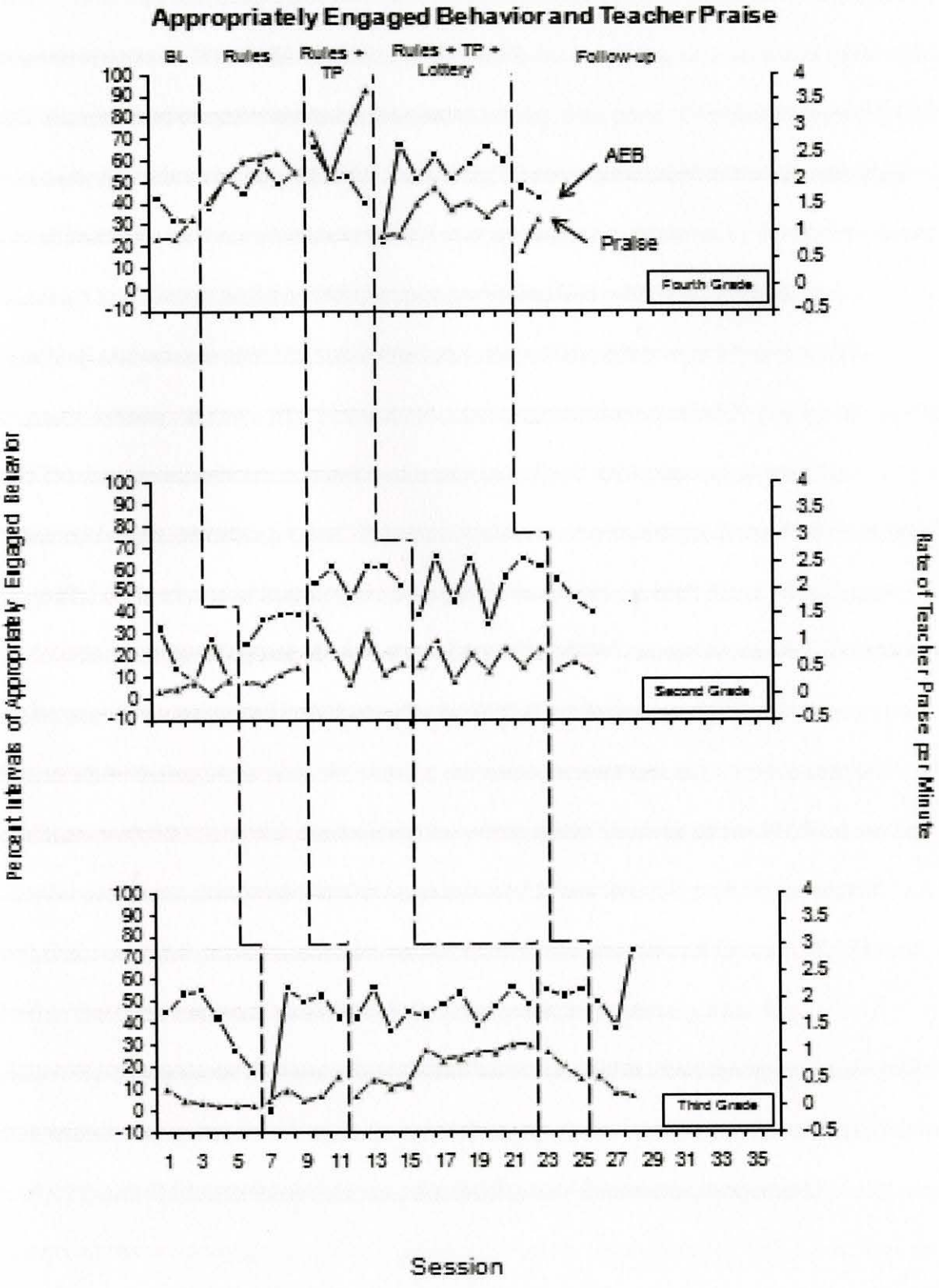

Figure 2. Percent of Intervals of AEB and Rate of Teacher Praise per Minute during 20-min Observation Sessions across Classrooms

For all classrooms, there was a marginal increase of AEB between baseline and the introduction of the direct teaching of the PBIS classroom expectations and rules with the exception of the third grade classroom's outlying data point. Changes in level of AEB between the direct teaching of PBIS rules with TP were substantial in the second grade classroom. For all three classrooms, there was a minimal increase of AEB between direct teaching and review of PBIS classroom expectations and rules with TP and direct teaching and review of PBIS classroom expectations and rules with TP and weekly Lottery. Finally, at two-, three-, and four-week follow-up level of AEB was maintained in the third grade classroom. In classrooms two and three, AEB was maintained but demonstrated a decreasing trend. Table 2 summarizes the means, and standard deviations of AEB, TP, and rate of teacher praise for each classroom for each phase of the study.

During baseline and the direct teaching of the PBIS classroom expectations and rules phase, the mean rate of TP was 0% for all three classrooms. This was expected to occur since during these first two phases, the teachers were not instructed to provide students with TP. After the implementation of the direct teaching of the PBIS classroom expectations and rules with TP, the mean rate of TP was .69, .28, and .50 for fourth, second, and third grade classrooms, respectively. The mean rate of TP was .56, .33, and .60 in the fourth, second, and third grade classrooms, respectively, after the implementation of the direct teaching of the PBIS classroom expectations and rules with TP and a weekly Lottery. Finally, during follow-up observations the mean rate of TP was .48, .17, and .37 in the fourth, second, and third grade classrooms, respectively.

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Table 2

Means and Standard Deviations for Percentage of Intervals Appropriately Engaged Behavior (AEB) Occurred, Mean Rate of Ticket Presentation Paired with Verbal Praise (TP), and Mean Rate of Verbal Praise

	Measure					
Classroom	AEB		TP		Praise	
	M	SD	M	SD	M	SD
Fourth Grade						
Baseline	35.42	.88	.00	.00	.98	.23
Rules	49.38	7.45	.00	.00	2.16	.35
Rules + TP	52.81	10.72	.69	.25	2.90	.67
Rules + TP +Lottery	54.83a	14.75b	.56	.24	1.38	.37
Follow-up	45.00	3.54	.48	.18	.95	.42
Second Grade						
Baseline	18.00	11.34	.00	.00	.12	.10
Rules	34.69	6.57	.00	.00	.30	.16
Rules + TP	56.04	6.25	.28	.22	.73	.48
Rules + TP + Lottery	53.90	12.95	.33	.21	.64	.27
Follow-up	47.08	7.54	.17	.03	.48	.10

Table 2 (continued).

Classroom	Measure					
	AEB		TP		Praise	
	M	SD	*M*	SD	*M*	SD
Third Grade						
Baseline	40.20	14.88	.00	.00	.08	.12
Rules	40.25[c]	23.05[d]	.00	.00	.25	.19
Rules + TP	47.05	6.64	.50	.34	.77	.35
Rules + TP + Lottery	53.75	1.44	.60	.11	.75	.25
Follow-up	53.75	18.41	.37	.35	.33	.19

[a]Calculation of the mean without the outlying data point produces a mean percentage of AEB of 59.58 in Rules + TP + Lottery Phase for the fourth grade class.
[b]Calculation of the SD without the outlying data point produces a SD of 6.34 in the Rules + TP + Lottery Phase for the fourth grade class.
[c]Calculation of the mean without the outlying data point produces a mean percentage of AEB of 50.31 in the Rules Phase for the third grade class.
[d]Calculation of the SD without the outlying data point produces a SD of 5.80 in the Rules Phase for the third grade class.

All three teachers demonstrated substantial increases in mean rate of praise with the introduction of direct teaching of the PBIS classroom expectations and rules and direct teaching of the PBIS classroom expectations and rules with TP. All three teachers demonstrated a decrease in mean rate of verbal praise with the introduction of the direct teaching of the PBIS classroom expectations and rules with TP with Lottery; with the third and fourth grade teachers, decreases were minimal. At two-, three-, and four-week follow-up, two of the three teachers demonstrated increases in mean rate of praise compared to baseline (i.e., the third and fourth grade teachers). At two- and three-week follow-up, the fourth grade teacher demonstrated a minimal decrease in mean rate of

praise compared to baseline. Due to the end of the school year, the investigators were unable to attain a four-week follow-up observation.

Statistical Analysis

Multilevel modeling has been recommended as a method to calculate average intervention effects and determine their statistical significance in multiple baseline designs (Ferron et al., 2009; Van der Noortgate & Onghena, 2003). Using multilevel modeling, heterogeneity in intervention effects across cases as well as the serial dependence of scores within cases can be appropriately addressed, permitting statistical inference.

The multilevel model for multiple baseline designs is described in the following. At level 1, observations are predicted by the following regression equation:

$$Y_{ij} = \beta_{0j} + \beta_{1j}(\text{phase})_{ij} + e_{ij}$$

where Y_{ij} is the observation for case j at occasion i, $(\text{phase})_{ij}$ is a dummy-coded indicator that equals 1 if the observation for case j at occasion i is in the intervention phase (defined in this study as all phases subsequent to baseline) and 0 for observations during baseline, and e_{ij} is a residual term representing the deviation of the specific observation from the average response for case j during baseline (β_{0j}) or intervention (β_{1j}). To capture the differences in average baseline and intervention observations across cases, two regression equations are specified at level 2:

$$\beta_{0j} = \gamma_{00} + u_{0j}$$

$$\beta_{1j} = \gamma_{10} + u_{1j}$$

where, γ_{00} and γ_{10} are the average levels of the dependent variable during baseline and intervention across cases, respectively, and u_{0j} and u_{1j} are residuals or the deviations of case j from the overall average baseline and intervention levels, respectively.

The multilevel model was fit as a linear mixed model in SAS 9.1 (SAS Institute, 2006). As recommended in Ferron et al. (2009) to minimize the bias in the estimate of the treatment effect and improve statistical inference, degrees of freedom were calculated using the Kenward–Roger method (Kenward & Roger, 1997), level 1 residuals (e_{ij}) were allowed to correlate in a first-order autoregressive structure, and restricted maximum likelihood estimation was used.

Model results are presented in Table 3. The estimates of the fixed effects are of primary interest. The value for the intercept (γ_{00}) indicates that AEB was observed in an average of 33.44% of baseline intervals across classrooms. The value for phase (γ_{10}) indicates that AEB was observed to occur an average of 15.87% more intervals in the intervention phases across classrooms (i.e., 49.3% of intervals), and this improvement was statistically significant ($p < .01$). Inspection of the covariance parameters indicates that there was little variation in the level 2 residuals, or deviations of the individual classrooms from the average baseline level (u_{0j}) or average intervention level (u_{1j}). In contrast, there was significant variance in the level 1 residuals (e_{ij}), which are the within-phase deviations of observations from the phase-average observation for individual classrooms. In addition, there was a significant amount of serial dependency in the level-1 residuals, as evidenced by the estimate of the first-order autoregressive parameter, suggesting that an ordinary least squares regression estimate of the intervention effect would have been biased.

Table 3

Results of Multilevel Model Estimating Average Intervention Effect

	Estimate	*SE*	*P*
Fixed Effects			
Intercept (γ_{00})	33.44	4.24	<.0001
Phase (γ_{10})	15.86	4.68	.002
Covariance Parameters			
Residual (e_{ij})	168.46	30.46	<.0001
AR(1)*	.28	.12	.021
Intercept (u_{0j})	.00	--	--
Phase (u_{1j})	.00	--	--

Note. *first-order autoregressive parameter

To calculate an overall effect size, the phase estimate (γ_{10} = 15.86) was divided by the square root of the residual variance ($\sqrt{168.46}$ = 12.98), yielding a standardized mean difference effect size, similar to Cohen's (1988) *d*, of 1.22 standard deviations. This value is approximately equal to the median value for the mean-shift effect size in the published studies reviewed by Parker et al. (2005).

Clinical Outcome Indices

Additional measures of effect size are reported to demonstrate the level of impact of the results using methodology based on Parker and Hagan-Burke (2007). Calculated measures of effect size include the *Success Rate Difference* and *Odds Ratio.* All of these measures define successful data as, "change beyond the level of the baseline phase" (Parker & Hagan-Burke, 2007, p. 640) and are conceptually similar to non-overlapping

data effect size measures. To calculate the effect sizes, the observed data are first rank ordered from lowest to highest, regardless of phase. Next, the data are grouped by expected phase based on rank, assuming no overlap in data from the baseline and intervention phases (i.e., the lowest values corresponding to the number of baseline observations are labeled as control and the highest values corresponding to the number of intervention observations are labeled as intervention). Last, the actual vs. expected phase status of individual data points are compared. The results are summarized in a 2 x 2 table, reflecting the actual status of the datum (i.e., baseline vs. intervention) and the observed outcome (i.e., improved or not improved based on expected phase with no data overlap between phases). For the purpose of this study, the intervention data consisted of the combined effects of direct teaching of the PBIS classroom expectations and rules, direct teaching and review of PBIS Classroom expectations and rules with TP, direct teaching and review of PBIS Classroom expectations and rules with TP and weekly Lottery, and Follow-up phases. The 2 x 2 table for data across all classrooms is depicted in Table 4. In addition, the 2 x 2 table for data separated by classroom is depicted in Table 5. Effect size measures for the combined data are depicted in Table 6. Effect size measures for data separated by classroom are depicted in Table 7.

Odds Ratio

The *Odds Ratio* compares the ratios of improvement in the intervention and baseline phases (Parker & Hagan-Burke, 2007). The odds ratio for the intervention phase is the number of points that do not overlap with the baseline data over the number of points that do overlap with baseline data (58/5 = 11.6). In the baseline phase, the odds ratio is the number of points that do overlap with intervention data over the number of

points that do not overlap (5/9 = .55). The Odds Ratio for the two groups is 11.6/.55 = 20.88, therefore the odds or likelihood of improvement in intervention is 20.88 times that of the baseline phase across all three classrooms.

Table 4

Crosstabs Output of AEB for Intervention Phase (the Combined Effects of Rules, Rules + TP, Rules + TP + Lottery, and Follow-Up) and Baseline Phase across All Three Classrooms

	Group/Condition		
Outcome	Intervention	Baseline	Total
Improved	58	5	63
Not improved	5	9	14
Total	63	14	77

Table 5

Crosstabs Output of AEB for Intervention Phase (the Combined Effects of Rules, Rules + TP, Rules + TP + Lottery, and Follow-up) and Baseline Phase in Each Classroom

Outcome	Grade Two			Grade Three			Grade Four		
	Group/Condition			Group/Condition			Group/Condition		
	Int.	BL	Total	Int.	BL	Total	Int.	BL	Total
Improved	20	1	21	18	4	22	19	1	20
Not improved	1	4	5	4	2	6	1	2	3
Total	21	5	26	22	6	28	20	3	23

Note. Int. = Intervention; BL = Baseline.

Table 6

Clinical Outcomes for AEB for the Comparisons of Intervention Phase (the Combined Effects of Rules, Rules + TP, Rules + TP +Lottery, and Follow-Up) and Baseline Phase across All Three Classrooms

Success Rate	Odds
Treatment	Treatment
58/63 = 92.06%	58/5 = 11.6/1
Control	Control
5/14 = 35.71%	5/9 = .55/1
Difference	Ratio
92.06 – 35.71 = 56.35%	11.6/.55 = 20.88

Table 7

Clinical Outcomes for AEB for the Comparisons of Intervention Phase (the Combined Effects of Rules, Rules + TP, Rules + TP + Lottery, and Follow-Up) and Baseline Phase in Each Classroom

Success Rate	Odds
Grade Two	
Treatment	Treatment
20/21 = 95.24%	20/1 = 20/1
Control	Control
1/5 = 20.00%	1/4 = .25/1
Difference	Ratio
95.24 – 20.00 = 75.23%	20/.25 = 80
Grade Three	
Treatment	Treatment
18/22 = 81.81%	18/4 = 4.5/1
Control	Control
4/6 = 66.67%	4/2 = 2/1
Difference	Ratio
81.81 – 66.67 = 15.15%	4.5/2 = 2.25
Grade Four	
Treatment	Treatment
19/20 = 95.00%	19/1 = 19/1
Control	Control
1/3 = 33.33%	1/2 = .50/1
Difference	Ratio
95.00 – 33.33 = 61.66%	19/.50 = 38.00

The Odds Ratio for the intervention phase in the second grade classroom is the number of points that do not overlap with the baseline data over the number of points that do overlap with baseline data (20/1 = 20; Parker & Hagan-Burke, 2007). In the baseline phase, the Odds Ratio is the number of points that do not overlap with intervention data over the number of points that do overlap (1/4 = .25). The Odds Ratio for the two groups is 20/.25 = 80, therefore the odds or likelihood of improvement in the intervention phase in the second grade classroom is 80 times that of the baseline phase. The Odds Ratio for the intervention phase in the third grade classroom is 18/4 = 4.5 and the Odds Ratio for the baseline phase is 4/2 = 2. The Odds Ratio for the two groups is 4.5/2 = 2.25, consequently the odds or likelihood of improvement in the intervention phase in the third grade classroom is 2.25 times that of the baseline phase. The Odds Ratio for the intervention phase in the fourth grade classroom is 19/1 = 19 and the Odds Ratio for the baseline phase is 1/2 = .50. The Odds Ratio for the two groups is 19/.50 = 38, therefore the odds or likelihood of improvement in the intervention phase in the fourth grade classroom is 38 times that of baseline phase.

Odds Ratios comparing baseline phase to the additive effects of each phase of the intervention (i.e., direct teaching and review of PBIS classroom expectations and rules, direct teaching and review of PBIS classroom expectations and rules with TP, direct teaching and review of PBIS classroom expectations and rules with TP and weekly Lottery, and Follow-up) across all three classrooms are displayed in Table 8. With the implementation of the direct teaching and review of PBIS classroom expectations and rules the odds or likelihood of improvement in all three classrooms is 6.88 times that of the baseline phase. The odds or likelihood of improvement for all three classes when

provided with the direct teaching and review of PBIS classroom expectations and rules is 11.16 times that of the baseline phase. The odds or likelihood of improvement for all three classes provided with the direct teaching and review of PBIS classroom expectations and rules with TP and weekly Lottery further increases to 18.00 times that of baseline phase. Finally, when the direct teaching and review of PBIS classroom expectations and rules with TP, weekly Lottery, and Follow-up phases are compared to baseline phases, the odds or likelihood of improvement in the intervention phases is 20.88 times that of the baseline phase.

Table 8

Odds Ratios of Comparing Baseline Phase to the Additive Effects of Each Phase of the Intervention across All Three Classrooms

	Odds
Baseline compared to	
Rules	6.88
Rules + TP	11.16
Rules + TP + Lottery	18.00
Rules + TP + Lottery + Follow-up	20.88

The Odds Ratio comparing baseline phases to the additive effects of each phase of the intervention for each classroom are displayed in Table 9. With the implementation of the direct teaching and review of PBIS classroom expectations and rules, the odds or likelihood of improvement 10.00, 3.00, and 12.00 times that of the baseline phase for the fourth, third, and second grade classrooms, respectively. The odds or likelihood of

improvement, when provided with the direct teaching and review of PBIS classroom expectations and rules with TP, is 18.00, 4.33, and 36.00 times that of the baseline phase for the fourth, third, and second grade classrooms, respectively. The odds or likelihood of improvement, when provided with the direct teaching and review of PBIS classroom expectations and rules with TP and weekly Lottery, is 34.00, 5.33, and 68.00 times that of baseline phase in the fourth, third, and second grade classrooms, respectively. Finally, with the implementation of direct teaching and review of PBIS classroom expectations and rules with TP, weekly Lottery, and Follow-up phases, the odds or likelihood of improvement is 38.00, 5.00, and 80.00 times that of the baseline phase for the fourth, third, and second grade classrooms, respectively.

Table 9

Odds Ratios of Comparing Baseline Phase to the Additive Effects of Each Phase of the Intervention across Each Classroom

	Odds
Fourth Grade	
Baseline compared to	
Rules	10.00
Rules + TP	18.00
Rules + TP + Lottery	34.00
Rules + TP + Lottery + Follow-up	38.00
Third Grade	
Baseline compared to	
Rules	3.00
Rules + TP	4.33
Rules + TP + Lottery	5.33
Rules + TP + Lottery + Follow-up	5.00
Second Grade	
Baseline compared to	
Rules	12.00
Rules + TP	36.00
Rules + TP + Lottery	68.00
Rules + TP + Lottery + Follow-up	80.00

CHAPTER IV

DISCUSSION

Research has demonstrated that effective classroom managers not only teach the rules of the classroom to their students, but review the rules with their students daily and provide examples of appropriate rule following behavior to their students (Emmer et al., 1980; Evertson & Emmer, 1982). In addition, proactive approaches as opposed to reactive approaches have been demonstrated to be more effective at both increasing students' appropriate behavior and decreasing students' disruptive behavior (Greenwood et al., 1974; Johnson et al., 1996; Madsen et al., 1968). Hebert (1997) demonstrated that by teaching students the rules of the classroom and presenting students with teacher verbal praise for appropriately engaged behavior, not only did the occurrence of student engagement in appropriate behavior increase, but engagement in inappropriate and disruptive behavior decrease.

PBIS is rooted deeply in applied behavior analysis and integrates many of the proactive classroom management strategies discussed in the previous paragraph (Carr et al., 2002; Dunlap, 2006; Tincani, 2007). In addition to teaching students rules that coincide with the expectations of the school district, PBIS emphasizes rewarding students for demonstrating appropriate behavior in a variety of school environments (e.g., classroom, hallway, lunchroom, and bus; Sugai & Horner, 2002, 2006). Typically the effectiveness of PBIS in decreasing students' disruptive behavior is measured through ODRs (Bohanon et al. 2006; Netzel & Eber, 2003; Scott & Barrett, 2004). Two problems associated with the use of ODRs include low reliability and validity, because ODRs rely heavily on the actions of teachers. In addition, ODRs are not direct measures of student

behavior (Nelson, Benner, Reid, Epstein, & Currin, 2002). Many of these concerns with the use of ODRs leave the impact of PBIS difficult to assess.

Research Questions

The current study was driven by four research questions. The first question sought to determine the effects of teaching PBIS classroom expectations and rules specific to those expectations on students' appropriately engaged behavior. In addition, the study sought to investigate the effects of combining the teaching of PBIS classroom expectations and rules with praise and the presentation of tickets as tokens on appropriately engaged behavior. The third research question sought to determine the combined effects of teaching PBIS classroom expectations and rules with verbal praise and the presentation of tickets as tokens with the implementation of a weekly Lottery system on appropriately engaged behavior. The fourth and final research question sought to determine whether students' engagement in appropriate behavior and teachers' implementation of the program would be maintained two-, three-, and four-week after the termination of the project.

Research Questions One

With regard to the first research question, results from this study indicated that teaching PBIS classroom expectations and rules specific to those expectations in the fourth grade classroom produced gradual changes in level and trend on students' appropriately engaged behavior. In addition, it should be noted that the measure used to monitor students' AEB was conservative and that readers should take that into consideration when judging the effectiveness of the intervention on students' AEB. In the fourth grade classroom, the introduction of the direct teaching of the PBIS classroom

expectations and rules phase produced gradual increases in level and trend. This finding is consistent with descriptive studies that stress importance of reading, reviewing, and rehearsing the classroom rules as an effective classroom management strategy (Cothran et al., 2003; Emmer et al., 1980; Evertson & Emmer, 1982). This finding is also consistent with Johnson et al.'s, (1966) investigation that demonstrated that the rules intervention was effective at increasing students' appropriate behavior. Furthermore, the increases in AEB after the introduction of the direct teaching of the PBIS classroom expectations and rules is inconsistent with Greenwood et al. (1974) and Madsen et al. (1968) investigations which determined that the introduction of rules alone was ineffective at increasing appropriate behavior.

The introduction of the teaching of PBIS classroom rules specific to the expectations in the third grade classroom (with the exception of the outlying data point), produced a sudden change in level on students' appropriate behavior. It was reported that the classroom was divided into three groups and in each of those groups, one student was either lying his head on his desk or engaged in disruptive behavior which led to 0% of the student's demonstrating AEB. It should be noted that if the outlier is removed from the calculation of the mean, the mean percentage of appropriate behavior in the rules phase increases from 40.25% to 50.31% and the *SD* decreases from 14.75 to 6.34. Finally, the introduction of the teaching of PBIS classroom rules specific to the expectations in the second grade classroom produced sudden change in level, trend, and variability on students' appropriately engaged behavior.

Although teachers were not instructed to praise more during the direct teaching of the PBIS classroom expectations and rules phase, teacher verbal praise was recorded

throughout all phases in the study. As a result of reading the PBIS classroom rules once a day, prior to the beginning of instruction, teachers in all three classrooms demonstrated increases in their rate of praise statements per minute. For example, the fourth grade teacher increased her mean rate of praise statements from .98 to 2.16 per min, the third grade teacher increased her mean rate of praise statements from .08 to .25 per min, and the second grade teacher increased her mean rate of praise statements from .12 to .30 per min. These demonstrated increases in teachers' use of praise may have been due to the teachers' increased awareness of appropriate behavior. Another possible for these demonstrated increases may have been that because of the reading of the rules, students were engaging in more appropriate behavior, which provided more opportunities for teachers to provide praise. Thus, the implementation of creating 3-5 rules and reading those rules once a day not only yielded changes in students AEB but also in teachers' use of verbal praise. Increases in teachers' use of praise may have influenced students' AEB. It is unclear as to whether the implementation of the direct teaching of the PBIS classroom expectations and rules, the increase in teachers' mean rate of praise, or the combination of both influenced students' AEB. However, due to the variability of increases in teachers' mean rate of praise statements, the increases in AEB are thought to be more influenced by the direct teaching and review of PBIS classroom expectations and rules.

Research Question Two

The second question included in the current study concerned the effects of combining the teaching of PBIS classroom rules with TP contingent on AEB. Overall, the addition of TP to the direct teaching and review of PBIS classroom expectations and rules

produced variable effects on students' AEB compared to the previous phase. However, the introduction of the phase produced overall increases in mean percentage of students AEB which is consistent with the literature on the use of tokens as reinforcers (O'Leary et al., 1969). In addition, the combination of direct teaching and review of the PBIS classroom expectations and rules with TP produced increases in students mean percentage of AEB across all three classrooms when compared to the baseline mean percentage of AEB. One main difference between the current investigation and previous research is that during this phase, the tickets did not signal the possibility to access a backup reinforcer (i.e., a preferred privilege or tangible; Kelleher, & Gollub, 1962). Rather, during this phase the TP served as the backup reinforcer. One reason why variable results may have been obtained is that students involved in the study were between seven- and ten-years-old. The developmental level of students across the three classes may have influenced the reinforcing quality of TP or contributed to the mixed results with the introduction of TP (i.e., TP may be more reinforcing to younger students and less reinforcing to older students; Burnett, 2002). This may have been evident in the second grade classroom that demonstrated a dramatic change in level and a relatively stable trend of students' mean percentage of AEB. Since this classroom had the youngest students, the reinforcing quality of the TP may have been stronger compared to the older students (i.e., those students in third and fourth grade).

The introduction of the direct teaching and review of PBIS classroom expectations and rules with TP may have produced variable results within classrooms due to the novel quality of the ticket (i.e., the reinforcer uncertainty produces high levels of anticipation since the reward was unknown) at first (Kehle, Bray, Theodore, Jenson, &

Clark, 2000). However, after the mystery of the ticket or anticipation becomes less salient, the reinforcing quality may have decreased (e.g., the decreasing trend demonstrated in the fourth grade classroom).

The introduction of the direct teaching and review of PBIS classroom expectations and rules in the third grade classroom produced minimal changes in students' mean percentage of AEB. In addition, students' percentage of AEB was variable during this phase. However, if the mean percentage of AEB is calculated without the observed outlying data point in the previous phase, the introduction of the direct teaching of the PBIS classroom expectations and rules would have produced a decrease (i.e., from 50% to 47%) in level of mean percentage of AEB.

The minimal increase in mean percentage of AEB may have been a result of the third grade teacher's low treatment integrity during this phase. During the first observations, Ms. Jackson provided students with TP on only two, one, and three occasions (during the first, second, and third observation, respectively). She was instructed, however, to hand out at least five TPs. In addition, Ms. Jackson failed to pair the tickets that she handed out with teacher verbal praise during an integrity check on the third observation during this phase. It was not until the fourth observation that Ms. Jackson met the criterion of five TPs per 20-min observation. This may have led to the inconsistent results when compared with the other two classrooms. Unlike Ms. Jackson, the other two teachers provided students with TP beyond the required amount during the first two observations for the second grade teacher and during all four observations for the fourth grade teacher. It is interesting to note that the third datum in the direct teaching of the PBIS classroom expectations and rules and expectations coincides with a day that

Ms. Caleb only handed out two TPs while on the previous two days, she handed out nine, and on the following three days she handed out eleven, two, and one. The decrease in the number of TP provided by the teachers may have led to the decreasing trend demonstrated in this phase. Similar to Ms. Caleb, Ms. Prudence provided students with more TP than what was required of her (i.e., 19, 10, 17, and 9 TPs for the first, second, third, and fourth observation, respectively) with the introduction of the direct teaching of the PBIS classroom expectations and rules.

Finally, the mean rate of verbal praise statements provided by the teacher increased as a result of providing students with TP (i.e., from 2.16 to 2.90, .25 to .77, and from .30 to .73, for the forth, third, and second grade teacher, respectively). Mean rate of teacher verbal praise statements in the third grade classroom may also explain the variable percentages of AEB previously discussed. Although teachers were not instructed to praise students independent of TP, increases in praise typically occurred with increases in the use of TP. Consequently, Ms. Jackson demonstrated low levels of teacher verbal praise at the onset of this phase which may have had some impact on students' AEB at the beginning of this phase. It is also interesting that these increases were not equal to the mean rate of TP in this phase, but higher than the mean rate of TP. This suggests that even though teachers were instructed to provide five TPs to students during the 20-min observation, not only did teachers follow instructions accurately (with the exception of Ms. Jackson at the beginning of the phase), but their mean rate of praise increased as a result.

Research Question Three

The third research question of the study sought to determine the effectiveness of adding the introduction of a weekly Lottery system to the direct teaching and review of PBIS classroom expectations and rules with TP. Overall, students' mean percentage of AEB across the three classrooms was variable following the introduction of this phase. Although, the some researchers have demonstrated the effectiveness of a Lottery system through decreasing the annual number of ODRs (Luiselli, Putnam, & Sunderland, 2002; Menendez, Payne, & Mayton, 2008; Netzel & Eber, 2003), the effectiveness of a Lottery system on AEB in the classroom setting has not been previously evaluated. If the slight increases in students' AEB and overall effectiveness of the direct teaching of the PBIS classroom expectations and rules with TP and a weekly Lottery are related to decreases in ODRs, then results may be consistent with previous research. Future research should assess the relationship between increases in students' AEB in the classroom to yearly ODRs.

The addition of the weekly Lottery systems to the teaching of PBIS classroom expectations and rules with TP produced a minimal increase in level and change in variability of students' AEB in the fourth grade classroom. However, if the outlying data point is removed from the calculation of the mean percentage of AEB, the mean percentage increases from 54% to 59% and the *SD* decreases from 23.05 to 5.80. During this observation, the students had just voted for which privileges or tangibles they could earn if their ticket was chosen in the Lottery. Also, students were informed that all tickets they had previously earned were to be discarded. This may have led to an immediate decrease in percentage AEB as noted by the outlying data point.

The addition of the weekly Lottery to the teaching of PBIS classroom expectations and rules with TP in the second grade classroom produced an increase in variability with a marginal decrease in the mean percentage of students' AEB. Although a decrease in the mean percentage of AEB occurred with the change in phase, it should be noted that the percentage of AEB in this phase was highly variable. This increase in variability may be due to variable levels of treatment integrity demonstrated by the second grade teacher during this phase (e.g., range 66.66% - 100%). Throughout the entirety of this phase, Ms. Caleb's rate of TP was also highly variable (range = .05 -.65 per min).

The mean rate of TP increased marginally after the introduction of the direct teaching and review of PBIS classroom expectations and rules with TP and a weekly Lottery in two of the three classrooms (i.e., form .50 to .60 and from .28 to .33 in the third and second grade classrooms, respectively). This may have influenced the minor increases in students' engagement in AEB in the third grade classroom. It is uncertain as to how this increase may have influenced students' percentage of AEB since the percentages in this phase are extremely variable for this classroom.

The introduction of the direct teaching and review of PBIS classroom expectations and rules with TP and a weekly Lottery system produced decreases in variability and a minimal increase of level of students' AEB in the third grade classroom. Also, the introduction of this phase in the second grade classroom produced a decrease in mean percentage and an increase in variability of percentage of AEB. It may be the case that due to the developmental level of the younger students (i.e., the second and third grade students); a weekly Lottery in which students may or may not have the opportunity

to obtain a reward was not a rich enough schedule of reinforcement. In order for the Lottery system to be a backup reinforcer in which students are motivated to receive TPs, the Lottery may need to occur on a more frequent basis (i.e., more than once a week; Kelleher & Gollub, 1962). Future research may examine whether thicker schedules of reinforcement produces greater increases in appropriately engaged behavior for younger students.

Finally, it should be noted that the mean rate of praise statements somewhat decreased in the third and second grade classrooms (i.e., from .77 to .75 and from .73 to .64 in the third and second grade classrooms, respectively). Even more interesting is that the classroom that demonstrated the highest gains in mean rates of praise with the introduction of the rules had substantial decreases in mean rate of praise statement with the introduction of the weekly Lottery (i.e., from 2.90 to 1.38). This decrease in praise may have impacted the mean percentage of students' AEB for all three classrooms since teacher praise has been found to increase appropriate behavior (Burnett, 1999). It is unknown as to why the introduction of the direct teaching of the PBIS classroom expectations and rules with TP and a weekly Lottery. However, it is speculated that if the Lottery occurred more than once a week, both teachers' rate of TP and verbal praise and students' percentage of AEB may have increased. Future research should address the effects of increasing the frequency of the Lottery system, especially in classrooms with younger students.

Research Question Four

The fourth and final research question of this study sought to determine whether students' mean percentage of AEB and teachers' implementation of the intervention

would be maintained two-, three-, and four-weeks after the termination of the project. The primary investigator was only able to attain two- and three-week follow-up observations in the fourth grade classroom due to a change in schedule which was attributed to the ending of the school year. Since only two data points were attained in the fourth grade classroom, an estimate of level is attainable, but variability and trend are indistinguishable (Hayes et al., 1999). At two- and three-week follow-up observations in the fourth grade classroom, dramatic decreases in level compared to the final phase of intervention were observed in both students' mean percentage of AEB and in teacher implementation of the program. However, level of mean percentage of AEB was slightly higher compared to baseline levels of students' mean percentage of AEB (i.e., 45% and 35% in follow-up and baseline, respectively). During follow-up observations, the fourth grade teacher attained 100% integrity. However, TP and teacher verbal praise had decreased which may have contributed to the decrease in students' mean percentage of AEB.

In the second grade classroom, at two-, three-, and four-week follow-up, decreases in level and trend in students' mean percentage of AEB compared to the previous phase were observed. In addition, decreases in teacher implementation of TP were observed which may have contributed to the low levels of students' mean percentage of AEB. However, level of students' mean percentage of AEB was substantially higher compared to baseline level (i.e., 47% and 18% in follow-up and baseline, respectively).

Finally, in the third grade classroom, although data were collected at two-, three-, and four-weeks after the termination of the program, only the two- and three-week data

points should be considered for discussion. This is due to the outlying data point obtained at the four-week follow-up. This outlying data point may have been the result of a party the students were having. During this observation, students were only expected to eat their snack and talk with their peers as opposed to the other observations which students were expected to engage in math assignments and attend to the teacher. The same implications for the four-week follow-up observation apply to the teacher's implementation of the program. During this final observation, the teacher was not observed to provide the students with any tickets as tickets for appropriate behavior. Therefore, similar to the fourth grade classroom, because only two data points occurred during instruction, an estimate of level is attainable, but variability and trend should be made with caution (Hayes et al., 1999). During follow-up observations, a gradual change in level compared to the previous phase of the intervention on students' mean percentage of AEB was observed. In addition teacher implementation of TP was maintained during this phase. Level of students' mean percentage of AEB was marginally higher in compared to baseline levels of AEB (i.e., 53% and 40% in follow-up and baseline, respectively).

The mean rate of TP decreased in all three classrooms during the two-, three-, and four-week follow-up observations (i.e., decreases form .56 to .48, .60 to .37, and .33 to .17 in the fourth, third, and second grade classrooms, respectively). Similarly, the mean rate of praise statements substantially decreased in all three classrooms during the follow-up observations (i.e., decreases from 1.38 to .95, .75 to .33, and .64 to .48 in the fourth, third, and second grade classrooms, respectively). Mean rate of praise statements in the fourth grade classroom decreased to mean rates similar to those observed during the

baseline phase. Mean rates of praise in the third grade classroom decreased to mean rates similar to those observed in the rules phase. Decreases in teachers' praise may have influenced the decrease in mean percentages of students' AEB. Despite these decreases in TP and teacher verbal praise, all three teachers attained high levels of integrity during the follow-up phase.

Although all students in all three classrooms demonstrated decreases in mean percentage of AEB at two-, three-, and four-week follow-up observations, the mean percentage of AEB was still higher than observed during baseline, prior to intervention. Clinical outcome indices suggest those that were provided with the intervention (i.e., direct teaching and review of PBIS classroom expectations and rules, direct teaching and review of PBIS classroom expectations and rules with TP, direct teaching and review of PBIS classroom expectations and rules with TP and Lottery; and Follow-up) were 56.35% more successful at demonstrating AEB compared to those in the baseline condition for all three classrooms. In addition, those that were provided with the intervention were 75.23%, 15.15%, and 61.66% more successful at demonstrating AEB compared to those in the baseline condition in the fourth, third, and second grade classrooms, respectively. In addition, clinical outcome indices indicated that the odds or likelihood of success in the intervention condition is 20.88 times that of the baseline condition across all three classrooms. Also, the odds or likelihood of success in the intervention condition is 80, 2.25, and 38.00 times that of the baseline condition in the fourth, third, and second grade classroom, respectively.

Multilevel modeling indicated that AEB was observed to occur in 15.87 more intervals than in the baseline (i.e., an increase from 33.44% to 49.31% from baseline to

intervention, respectively). Finally, multilevel modeling produced a r value = .45, which is equivalent to an average effect size of d = 1.01 standard deviations. The statistical analyses provided in this study were included to provide an effect size for further evaluation of this area through meta-analyses and to permit statistical inference. Future research should further investigate the PBIS literature through meta-analyses.

Limitations and Future Research

The overall findings of this study contribute and expand the empirical base of PBIS as related to the class-wide component. However, these findings are only preliminary in nature given some methodological issues and the limited sample size. Consistent with any and all research studies, there are a number of limitations of this research study that should be addressed in future investigations so that important gaps in the PBIS knowledge base are filled. Below are the studies current limitations and areas for future research.

The first limitation addresses the methodological problems associated with the observation procedures of students' AEB. Although the observation method of students' AEB was conservative and is a relative strength of this study, there is a methodological weakness that should be noted. Since the number of groups or rows of students per classroom (i.e., 3 groups compared to 6 groups) was not consistent across classrooms and observations, the occurrence of students' AEB in each classroom may have been either under- or overestimated. That is, if the classroom was divided into three groups, and one student in one group was consistently observed to not demonstrate AEB, the classroom would not be able to attain more than 66% AEB. However, if that same classroom was divided into 5 groups, then the classroom would not be able to attain more than 80%

AEB. Future research should address this problem by specifying that all classrooms involved in the study should be divided by the same number of groups or rows of students.

A second limitation addresses similar methodological problems associated with the observation procedures of students' AEB. Since a minimum or maximum number of students allowed in each row or group was not established, the occurrence of AEB may have been either over- or underestimated depending on the number of students placed in each group. Similar to the previous limitation, the number of children in each group posed as a potential confound to the study in that groups of eight children were less likely to all demonstrate AEB at a given time compared to groups of three children. Future research should address this problem by specifying the number of students in each group or at least providing a minimum or maximum number of students allowed in each group or row of students.

Another potential confound in the current study's methodology involves the time of day that the teachers read the rules. The fourth grade teacher specialized in mathematics instruction requiring the classes in the fourth grade to rotate through her class. Ms. Prudence varied from the second and third grade teachers in that she reviewed the PBIS expectations and rules immediately prior to the beginning of math instruction which was after the students had lunch and during the final period of the day. The third and second grade teachers reviewed the PBIS expectations and rules immediately prior to the beginning of all instruction (i.e., right at the beginning of the day). Therefore, the students in the third and second grade class had approximately a four hour delay before AEB was observed, whereas the fourth grade classroom did not experience such a delay

and was observed immediately after the review of the PBIS rules and expectations. Future research should address this problem by requiring the delay between the reviewing of the PBIS expectations and rules and the observation of AEB.

Another limitation of the current study involved the inability to attain a four-week follow-up observation in the fourth grade classroom. Because the study's conclusion occurred during the last weeks of the classroom's school year, many scheduling difficulties due to testing, free days, assemblies, etc. were experienced and led to the inability to attain a four-week follow-up observation. The inability to attain a third datum in the follow-up phases only allowed the author to make estimates of level (Hayes et al., 1999). In addition, since only two data points were collected in this phase, estimates of variability and trend were indistinguishable. Future areas of research should attain at least three data points in all follow-up phases so that estimates of level, trend, and variability around level and trend can be distinguished.

The outlying data points observed in the third and fourth grade classrooms serves as another potential limitation of this study. Similar to that discussed in the previous paragraph, due to the four-week follow-up data point attained in the third grade classroom, only estimates in level should be made in that particular phase. Estimates of trend and variability should be made with caution, since this datum point was attained during a party, and students were only expected to eat their snacks and talk with their friends (i.e., the students were not expected to engage in academic material or attend to the teacher). In addition, the third grade and fourth grade classrooms attained two data points that were extreme outliers. There was no explanation for this except that each group or row of students had at least one student in the group that refused to participate in

the class activity. Future research may address this issue by standardizing the number of students in each group of students and the maximum or minimum number of groups allowed in each classroom.

Another limitation of the current study addresses the limitation of effect sizes and clinical outcome analyses. Both clinical outcome indices and effect sizes only reflect amount of change, but do not explain the cause of change. These indices do not reflect a treatment effect; rather only reflect the amount of change. However, the internal validity of the current study is strengthened with the components of the multiple baseline procedures.

The fixed-effect estimates produces through multilevel modeling are typically unbiased. The statistical significance of these estimates are based on the estimated standard errors and degrees of freedom. Although there is a variety of ways to estimate the degrees of freedom, these tests typically have a limited impact when the Level 2 sample size is large (i.e., the number of classrooms). Therefore, a limitation of these results is the small Level 2 sample size. Future research should replicate these results to increase the number of classrooms added to the multilevel modeling analysis.

Another limitation of the study is the possibility of order effects. The direct teaching and review of PBIS classroom expectations and rules phases followed baseline and always preceded the direct teaching and review of PBIS classroom expectations and rules with TP. In addition, the direct teaching and review of PBIS classroom expectations and rules with TP always preceded the direct teaching and review of PBIS classroom expectations and rules with TP and weekly Lottery. It may be possible to determine if immediate gains in AEB could be found from baseline to direct teaching and review of

PBIS classroom expectations and rules with TP. In addition, it may be possible that immediate gains in AEB may be demonstrated from baseline to direct teaching and review of PBIS classroom expectations and rules with TP and Lottery. Future research may answer this question by assessing comparing baseline conditions to each three additive components of the current study.

A final limitation of the current study is the small sample size which is typical of single case experimental designs. Although the use of single case design allows for control of internal validity issues, the small sample size limits the generalizability of the current findings. However, the differences in grade level of classrooms and teacher experience in teaching aids the generalizability of the current findings. Future research should include different areas of instruction (e.g., reading, writing, or social studies) and students from different demographic areas to expand the external validity of the current study.

Summary

The purpose of the present study was to evaluate the effectiveness of positive behavior intervention support in increasing AEB in the classroom. More specifically, the present study was intended to assess the additive effects (a) of teaching PBIS classroom expectations and rules specific to those expectations of student's AEB on students' AEB, (b) of presenting TP as acknowledgement for students' engagement in behavior in compliance with the rules as related to each expectation on students' AEB, (c) of the implementation of a weekly Lottery system on students' AEB, and (d) whether students' AEB and teachers' implementation of intervention procedures would be maintained at a two-, three-, and four-week follow-up. The present results suggest that the

implementation of certain components of PBIS may be more effective at increasing students' appropriate behavior in the two out of the three classrooms (i.e., the combined effects of teaching PBIS expectations and presenting tickets paired with praise as acknowledgement for students' engagement in appropriate behavior). However, such statements cannot be made since the direct teaching of the PBIS classroom expectations and rules with TP always followed the direct teaching of the PBIS classroom expectations and rules phase and was not compared directly with baseline conditions.

The current study demonstrates that the additive effects of the direct teaching and review of PBIS classroom expectations and rules, the direct teaching and review of PBIS classroom expectations and rules with TP, and the direct teaching and review of PBIS classroom expectations and rules with TP and a weekly Lottery system produced variable gains across three classrooms. Previous research on outcome measures of PBIS has typically focused on ODRs which are not direct measures of behavior, but rather are predicated on the teacher's perception or judgment of the student's behavior. Therefore, more research is needed on the class-wide effects of PBIS procedures on students' observable behavior.

APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL

THE UNIVERSITY OF SOUTHERN MISSISSIPPI

Institutional Review Board

118 College Drive #5147
Hattiesburg, MS 39406-0001
Tel: 601.266.6820
Fax: 601.266.5509
www.usm.edu/irb

HUMAN SUBJECTS PROTECTION REVIEW COMMITTEE
NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Human Subjects Protection Review Committee in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months. Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: **28120803**
PROJECT TITLE: **An Investigation of the Classroom Component of Positive Intervention and Support System on Appropriately Engaged Behavior**
PROPOSED PROJECT DATES: **01/05/09 to 10/01/09**
PROJECT TYPE: **Dissertation or Thesis**
PRINCIPAL INVESTIGATORS: **Kathryn M. Menousek**
COLLEGE/DIVISION: **College of Education & Psychology**
DEPARTMENT: **Psychology**
FUNDING AGENCY: **N/A**
HSPRC COMMITTEE ACTION: **Expedited Review Approval**
PERIOD OF APPROVAL: **12/16/08 to 12/15/09**

Lawrence A. Hosman
Lawrence A. Hosman, Ph.D.
HSPRC Chair

12-16-08
Date

APPENDIX B

TEACHER CONSENT FORM

University of Southern Mississippi
Consent Document for Research Participants

Title of Study:
An investigation of the classroom component of positive behavior support system on appropriately engaged behavior.

Purpose
You are being asked to participate in a study that is studying the effects of Positive Behavior Interventions and Support (PBIS) in increasing appropriately engaged behavior (AEB) in the classroom. This study is important because it may provide teachers with a class-wide intervention to increase appropriately engaged behavior and offers support for PBIS at the classroom-wide intervention

Participants:
Your students must be enrolled in a general education classroom. The students in your classroom must engage in appropriate behavior in no more than 80% of the observed intervals in a 20-min classroom screening observation. If your classroom does not meet criteria a school psychologist-in-training at USM may still provide you with assistance for other ways to address your classroom's problem behaviors.

Procedure:
If you agree to be in this study and if your classroom is selected for the study, you will be asked to give instructions to your classroom in the same manner that you would on a regular basis. If your classroom is observed to engage in appropriate behavior no more than 80% of the observed intervals in a 20-min classroom screening observation, at least two more observations will be conducted in this same manner. Next, you would then meet with the primary investigator to create a set of rules. Following this you would teach the rules of the class to your students. Then, you would continue to teach the rules of the class to your students but you would also award your students by giving them a ticket with verbal praise. Finally, the tickets you award students will then be put in a drawing at the end of the week to win a pre-determined prize. The experimenter and a trained graduate student will observe you and your classrooms' behavior to see if there is a difference in your classrooms' engagement in appropriate behavior based on the procedures used.

Benefits/Risks to Participant:
Your participation in the study will help you increase your students' engagement in appropriate behavior in the classroom. The potential risks include a possible increase in your students' inappropriate because it may be that the use of these procedures could increase inappropriate behavior. Your students' also will be presented new classroom procedures and rules and may become frustrated by the expectation of engagement in

appropriate behavior. Because of this your students' will be given tickets with verbal praise for engagement in appropriate behavior.

Voluntary Nature of the Study/Confidentiality:
Your participation in this study is entirely voluntary and you may refuse to complete the study at any point during the experiment, or refuse to answer any questions with which you are uncomfortable. In addition, all information obtained during the study will be kept confidential. All information that may identify you will be withheld. Your name and other identifying information will not be used in the research papers, any submission to a professional journal for publication, or presentation. The only circumstances in which we would release information about you or your students would be if one of your students tells use he/she is a harm to self or others, if one of your students is abused, if the release of information is court ordered, or if there is a medical emergency in which release of information is important for someone's safety.

Contacts and Questions:
At any time you may withdraw from the study or ask any questions you may have regarding this study. Questions concerning the research should be directed at Kathryn Menousek or Dr. Joe Olmi at (601) 266-5255 or via email at kathryn.menousek@usm.edu or d.joe.olmi@usm.edu. This project has been reviewed by the Human Subjects Protection Review Committee, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research subject should be directed to the chair of the Institutional Review Board, The University of Southern Mississippi, 118 College Drive #5147, Hattiesburg, MS 39406-0001, (601) 266-6820. A copy of this form will be given to the participant.

Participant's Consent:
I have had the purposes and procedures of this study explained to me and have had the opportunity to ask questions. My questions have been answered to my satisfaction, and I am voluntarily signing this form for me to participate in this research study. My signature shows my willingness to allow me to participate in this study under the conditions stated.

This Section to be Completed by Teacher

_____ _____

Name of Teacher *Date*

APPENDIX C

CLASSROOM RULES OBSERVATION FORM/TREATMENT INTEGRITY

1. **Appropriately engaged behavior** is defined as student directing attention toward or engaged in the currently assigned activity (e.g., raising one's hand and waiting to be recognized before speaking, writing on/computing solutions on assigned math worksheet, sitting with hands and feet to yourself during instruction). **Appropriately engaged behavior** will be recorded only if all students within the row or small group being observed are appropriately engaged in the assigned activity.

2. You will use hash marks to record the frequency of occurrence of **ticket presentation with praise** during the 10 s interval. At the first beep following the 10 s interval, you will use a momentary time-sampling method to observe **appropriately engaged behavior** for the whole group being observed.

3. You will use the remaining five seconds after the beep to record the occurrence of **appropriately engaged behavior** at the end of the interval if displayed by the whole group being observed at one moment.

4. Each row of children will be observed in turn, for four consecutive 15 s intervals, throughout each 20 min observation period. During the first 10 s the entire classroom will be observed for each occurrence of **ticket presentation with verbal praise.** The recording will simultaneously cue the end of the observation of the ticket presentation with verbal praise and will also cue the observer to note whether the entire row of students are engaged in appropriate behavior at that instant. Then the observer will move to the next row and repeat this process.

5. Begin observation at the front left position in the class and move systematically to the bottom right position; observe students in rows. Visually observe every child in the row during each momentary time sample.

Teacher name: _____ Date: _____ Observer name: _____ Classroom Activity: _____ Number of Ticket Presentation with Verbal Praise System: _____ Appropriately Engaged Behavior: _____ Phase: _____ Praise: _____

	Row ____				Row ____				Row ____				Row ____			
	0.15	0.30	0.45	1.00	1.15	1.30	1.45	2.00	2.15	2.30	2.45	3.00	3.15	3.30	3.45	4.00
TP																
AEB																
Praise																
	Row ____				Row ____				Row ____				Row ____			
	4.15	4.30	4.45	5.00	5.15	5.30	5.45	6.00	6.15	6.30	6.45	7.00	7.15	7.30	7.45	8.00
TP																
AEB																
Praise																
	Row ____				Row ____				Row ____				Row ____			
	8.15	8.30	8.45	9.00	9.15	9.30	9.45	10.00	10.15	10.30	10.45	11.00	11.15	11.30	11.45	12.00
TP																
AEB																
Praise																
	Row ____				Row ____				Row ____				Row ____			
	12.15	12.30	12.45	13.00	13.15	13.30	13.45	14.00	14.15	14.30	14.45	15.00	15.15	15.30	15.45	16.00
TP																
AEB																
Praise																
	Row ____				Row ____				Row ____				Row ____			
	16.15	16.30	16.45	17.00	17.15	17.30	17.45	18.00	18.15	18.30	18.45	19.00	19.15	19.30	19.45	20.00
TP																
AEB																
Praise																

APPENDIX D

SAMPLE TICKETS FOR MS. JACKSON'S CLASS

You have been caught following Ms. Jackson's classroom rules!  Keep up the Great Work!	You have been caught following Ms. Jackson's classroom rules!  Keep up the Great Work!
You have been caught following Ms. Jackson's classroom rules!  Keep up the Great Work!	You have been caught following Ms. Jackson's classroom rules!  Keep up the Great Work!

APPENDIX E

EXAMPLES OF TEACHER'S CLASSROOM RULES

Ms. Caleb

1. Keep your eyes on the teacher during instruction
2. Follow instructions the first time they are given
3. Talk only after you have raised your hand have been called upon
4. Complete all of your work on time
5. Keep your hands and feet to yourself

Ms. Jackson

1. Follow instructions the first time they are given
2. Keep your hands and feet to yourself
3. Use kind words when talking to your classmates
4. Talk only after you have raised your hand have been called upon
5. Complete all of your work on time

Ms. Prudence

1. Follow instructions the first time given
2. Talk only after you have raised your hand and been acknowledged by the teacher
3. Have all materials prepared at the beginning of instruction
4. Complete all of your work on time
5. Keep your hands and feet to yourself

APPENDIX F

DIRECT TEACHING OF THE PBIS CLASSROOM EXPECTATIONS AND RULES/TREATMENT INTEGRITY CHECKLIST

1. Introduces each rule individually.
2. Give examples of appropriate rule following for each rule.
3. Describe and demonstrate rule components (i.e., description and/or definition of rule vocabulary).
4. Give a rationale for the rule.
5. Give the class an introduction to a classroom rule practice section.
6. Conducts these steps once, prior to the beginning of the instruction period.

Script for Direct Teaching and Review of PBIS Classroom Expectations and Rules: Expectation One

Teacher	Student
"Today we're going to talk about the rules for our classroom. First we'll talk about what rules we follow when I am teaching a lesson to you." (Point to each rule as you say it.)	
"The first rule for lesson time is, 'Walk quietly in the classroom.' What is the first rule?" (Signal)	
	"Walk quietly to your seat."
"Right. That means that when you are moving around the classroom you are walking and not talking to other students."	
"Here's the second rule for lesson time; 'Follow the teacher's instructions.' What's the second rule?" (Signal)	
	"Follow the teacher's instructions."
"Right. That means that when I tell you to do something, you begin the task the first time I tell you to do it."	
"Now . . . by yourselves." (Pause) "Get ready." (Point to each rule as students say the rules)	
	"Walk quietly in the classroom. Follow the teacher's instructions."
"Very nice. Now let's practice doing what the rules say. I'm going to begin teacher a lesson. I want you to concentrate on following the rules during this practice time." (Place the rules poster near where you are standing most of the	

class period so that student can see it easily without diverting their attention from you.)	
Begin teacher the regularly scheduled lesson. Review the rules 2 times a day in the same manner outlined previously.	
"Now . . . by yourselves." (Pause) "Get ready." (Point to each rule as students say the rules)	

Script for Direct Teaching and Review of PBIS Classroom Expectations and Rules: Expectation Two

Teacher	Student
"Today we're going to talk about the rules for our classroom. First we'll talk about what rules we follow when I am teaching a lesson to you." (Point to each rule as you say it.)	
"The first rule for lesson time is, 'Keep the classroom clean.' What is the first rule?" (Signal)	
	"Keep the classroom clean."
"Right. That means that after you have used something in the classroom, you need to put it back where you got it. Also, that means, that if you make a mess, you need to clean up after yourself"	
"Here's the second rule for lesson time; 'Complete all of your work on time.' What's the second rule?" (Signal)	
	"Complete all of your work on time."
"Right. That means when I give you an assignment, you need to work on that assignment, until it is completed."	
"Now . . . by yourselves." (Pause) "Get ready." (Point to each rule as students say the rules)	
	"Keep the classroom clean. Complete all of your work on time."
"Very nice. Now let's practice doing what the rules say. I'm going to begin teacher a lesson. I want you to concentrate on following the rules during	

this practice time." (Place the rules poster near where you are standing most of the class period so that student can see it easily without diverting their attention from you.)	
Begin teacher the regularly scheduled lesson. Review the rules 2 times a day in the same manner outlined previously.	

Script for Direct teaching and review of PBIS Classroom Expectations and Rules: Expectation Three

Teacher	Student
"Today we're going to talk about the rules for our classroom. First we'll talk about what rules we follow when I am teaching a lesson to you." (Point to each rule as you say it.)	
"The first rule for lesson time is, 'Keep your hands and feet to yourself.' What is the first rule?" (Signal)	
	"Keep your hands and feet to yourself."
"Right. That means that you need to keep your feet silent and your hands on your desk when you are working and that you keep your hands by your side when you are walking in the classroom."	
"Here's the second rule for lesson time; 'Leave the classroom only when your teacher dismisses you.' What's the second rule?" (Signal)	
	"Leave the classroom only when your teacher dismisses you."
"Right. That means you need to remain inside the classroom, unless you have received my permission to leave the classroom."	
"The second rule for this lesson is, 'Talk only after you have raised your hand and been acknowledged by the teacher.' What's the rule?" (Signal)	
	"Talk only after you have raised your hand and been acknowledged by the teacher."

"That means you should talk only when you have raised your hand and I call on you, but not at any other time."	
"Now . . . by yourselves." (Pause) "Get ready." (Point to each rule as students say the rules)	
	"Keep your hands and feet to yourself. Leave the classroom only when the teacher dismisses you. Talk only after you have raised your hand and been acknowledged by the teacher."
"Very nice. Now let's practice doing what the rules say. I'm going to begin teacher a lesson. I want you to concentrate on following the rules during this practice time." (Place the rules poster near where you are standing most of the class period so that student can see it easily without diverting their attention from you.)	
Begin teacher the regularly scheduled lesson. Review the rules 2 times a day in the same manner outlined previously.	

APPENDIX G

BEHAVIORAL ROLE MODELLING OF THE CLASSROOM RULES

1. Instruct the teacher to silently read each rule out loud to the primary investigator as if she were teaching the class.
2. The primary experimenter will then role play, acting as a student.
3. Instruct the teacher to respond to the primary investigator as if he/she was a student in the class.
4. The primary investigator will provide the teacher with feedback and answer any questions concerning the direct teaching of the PBIS classroom expectations and rules.

APPENDIX H

TICKET PRESENTATION WITH VERBAL PRAISE

(Also serves as treatment integrity checklist)

1. Appropriate responses to classroom rules should be praised with ticket presentation approximately once every four minutes. Eighty percent of scheduled acknowledgment presentations should occur for treatment integrity (i.e., a minimum of 4 times every 20 minutes).

2. The ticket presentation with verbal praise should be explicitly linked to the appropriate behavior (e.g., "Betty, I like the way you raised your hand to talk.").

3. The teacher should present tickets to each row or grouping of students. She should be instructed to seek out students from each row of seats or grouping of students.

APPENDIX I

EXAMPLES OF REWARDS SELECTED IN EACH CLASSROOM FOR THE LOTTERY

Ms. Caleb

1. Group Captain
2. Treasure Box
3. Candy
4. 5 min computer time

Ms. Jackson

1. 10 min computer time
2. Treasure Box
3. Stickers
4. Pencils

Ms. Prudence

1. Stickers
2. Pencils
3. Candy
4. 5 min extra computer
5. 5 min extra time with Ms. Prudence
6. Table Captain

APPENDIX J

LOTTERY SYSTEM STEPS

(Also serves as treatment integrity checklist)

1. Upon the occurrence of ticket presentation with verbal praise the teacher will write down the students name on the ticket and place it in the Lottery box. Variations may be made to this process based on consultation between the primary investigator and the teacher due to differences in developmental levels of the students (e.g., older students may write their name on the paper and place the ticket into the Lottery box at the end of the instructional period).

2. Every Friday (or the last day of the school week) the teacher will draw four tickets out of the Lottery box. If a student's name is drawn more than once, he or she will not receive two rewards. Instead, the student's name will be moved to the side and the teacher will draw another ticket from the Lottery box.

3. Lottery box procedures will vary from classroom to classroom since PBIS tickets vary from school district to school district.

APPENDIX K

SCRIPT FOR TICKET PRESENTATION WITH VERBAL PRAISE FOR ADHERANCE OF CLASSROOM RULES

Introduce the rules in the same manner as before. However, after you've completed the introduction, present tickets with verbal praise to two or three students for following the rules, as often as possible. Use the wording of the rule to praise students along with the presentation of a ticket: "Good, John and Jason, you're watching the teacher. That's the way to pay attention" or "Mark and Susan, you're keeping you hands and feet to yourself, way to work." Call on different students each time you praise and refer to different rules. Proceed in this for 2 to 3 minutes, and then as you continue the lesson, present tickets at a lesser rate (you should continue to present tickets to students at an average of once every five minutes). It is also recommended that you "cruise the aisles" or "cruise around the room" to look for opportunities to give students a pat on the back along with the verbal reinforcement.

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